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Surgical Sub-Specialisation: A New Paradigm in Singapore

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Society of Colorectal
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Singapore

Proceedings of the Annual Combined Surgical Meeting 2012

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Welcome Message

The Annual Combined Surgical Meeting has in times past been an important event in the surgical calendar, bringing together surgeons of all specialties to a national meeting and thus engendering an atmosphere of education, exchange of ideas and fostering camaraderie in the surgical fraternity. It provided a platform for young surgeons to present their papers and meet their peers from different institutions. Indeed in a time where clustering of healthcare groups has reduced the opportunities to meet, it is with great pleasure and nostalgia that the Chapter of General Surgeons seeks to reinstate this meeting after an absence of a decade.

The theme of the 2012 meeting is 'Surgical Sub-Specialisation: A New Paradigm in Singapore'. The challenges of sub-specialisation are many, including fragmentation of care and increased costs to patients. However, with the march of surgical training and advances in technologies, the ability for a single surgeon to do every operation and master these technologies is becoming increasingly difficult. Meeting the educational objectives in one meeting has been helped in no small measure by the incorporation of 3 national surgical societies: the Society of Colorectal Surgeons of Singapore, Endoscopic & Laparoscopic Surgeons Asia (Singapore Chapter) and the Obesity & Metabolic Surgery Society. The symposia give a flavour of the latest advances in all of the major sub-specialties in general surgery. In addition, besides encouraging research presentations, the committee has decided to have a residents' debate comprising of teams from the 3 different clusters. This promises to be a great platform for a robust debate and time of learning from our surgical residents.

As chairman of the organising committee, and on behalf of my committee, may I extend a warm welcome and invitation to all general surgeons in Singapore to join in this event.

Dr Wong Soong Kuan

Organising Committee

Chairmen	Wong Soong Kuan, Ho Kok Sun, Anton Cheng, Shanker Pasupathy
Treasurer	Tan Kok Yang
Secretary	Dean Koh
Publicity	Shanker Pasupathy, Bernard Lim
Scientific Chairman	Stephen Chang

Key Note Lecture

Future Implications of Surgical Training – The Impact of Sub-Specialty Practice

Raj Mohan Nambiar

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Surgical training and practice are closely linked and depend on each other. The recent advances in surgery and the rapid development of sub-specialties have created new challenges in the training of residents.

The training of a surgeon with sub-specialisation can be best described in 4 stages. The first stage will be basic sciences as a foundation, the second stage in core general surgery, the third in advanced general surgery and or specialties and the final stage for further training in sub-specialty.

The training also includes non-surgical skills that are essential for providing good patient care.

The surgical training is currently facing serious problems due to increasing limitations of time and opportunity to achieve adequate clinical and operative skills for residents. The situation will only aggravate in future, in a rapidly changing environment with increasing patient expectation for specialised care.

As scientific and technological advances continue to change surgical practice, it is obvious that even the best residency training will be inadequate for a lifetime of practice. Continued practice based learning and training is the only logical way to keep up-to-date for future needs of practice.

Speakers' Abstracts

S1

Impact of Energy in MIS

Asim Shabbir

Consultant Surgeon, Division of Upper Gastrointestinal Surgery, University Surgical Cluster, National University Hospital Singapore, Singapore
Postgraduate Director, Department of Surgery, University Surgical Cluster, National University Hospital Singapore, Singapore

The perpetual evolution of technology has enabled surgeons to push the limits in all aspects of surgery. The minimally invasive approach has revolutionised surgical care, offering significant benefits to the patient. What seemed an impossible task at the advent of electrosurgery, is now a routine in the operating room. Though a wide variety of energy sources have been used in laparoscopy, electrosurgery with monopolar or bipolar applications remains the most versatile, most economical, and most widely available energy source for surgeons. When complications occur, it is generally impossible to trace back to the precise mechanism of injury. Because of the inherent difficulties and limitations associated with monopolar and bipolar energy, alternative energy sources that are considered safer, quicker and dexterous, yet more costly are becoming popular. Although numerous forms of energy delivered through various tools have been invented and are available for use, a surgeon should have sound knowledge of these devices and their limitations in order to minimise misuse and adverse outcomes. Regardless of the energy source and device, the final outcome of a procedure will rely on the surgeon's knowledge and skill, combined with good surgical decision-making.

S2

Recent Advances in Aortic Stent Grafting – Our Experience with Modified EVAR Techniques

Benjamin Chua

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Director, Endovascular Surgery, Department of General Surgery, Singapore General Hospital, Singapore

Aortic aneurysms with complex anatomies present a challenge for endovascular aortic aneurysm repair (EVAR). These anatomical complexities include short landing zones, angulated necks, involvement

of visceral arteries, tandem aneurysms in the aorta and iliac arteries and short common iliac arteries. Open aneurysmal repair has traditionally been offered to patients with complex anatomies. However, with recent advances in stent graft technology and the development of technical competence, many of these complex aneurysms can be treated with modified EVAR techniques. Goals of these complex EVAR repair techniques include preservation of key visceral vessel and preservation of internal iliac artery patency and blood flow. These techniques include EVAR with sandwich stents for concomitant iliac aneurysms, tandem EVAR with visceral chimney stents, hybrid fenestrated-branched custom-made devices for juxtarenal and thoracoabdominal aneurysms and iliac branched devices for iliac aneurysms. Over an 18-month period, we have performed more than 35 such complex stent grafting procedures with no mortality and minimal morbidity. We have developed significant experience with these new techniques and have developed protocols to ensure good outcomes. These include adopting a team-based approach, utilising a hybrid operating theatre and using specific endovascular devices for all cases. We present the key learning points from our experiences with these modified EVAR techniques.

S3

Limb Salvage – Bypass or Angioplasty

Peter Robless

Senior Consultant & Head, Division of Endovascular and Vascular Surgery, Department of Cardiac, Thoracic and Vascular Surgery, National University Heart Centre, Singapore

It takes a whole village to save a limb. A limb preservation programme should comprise multidisciplinary specialties involved in the care of patients with lower extremity vascular disease including endocrinologists, infectious diseases, orthopaedics, vascular surgery, cardiology, podiatry, vascular ultrasound and wound care nurses. With an increasingly elderly population in Asia and rising incidence of diabetes and lower limb amputation, there is a real need for limb salvage programmes which are cost-effective.

The decision to treat with bypass surgery, angioplasty or both is only the tip of the iceberg in a continuum of care. Three main areas are needed: prevention, treatment and rehabilitation. Preventing major amputations in patients with diabetic foot

problems should have emphasis on programmes for education by nurse educators on diabetic care, foot care and footwear as well as foot screening. Resources are required to staff a dedicated one stop vascular medicine clinic with non-invasive vascular ultrasound assessment and podiatry services.

It is likely that an endovascular first approach for limb salvage will be adopted in most centres with bypass surgery reserved for good risk patients. The team at NUH was able to show a 70% amputation free survival at 12 months in this group of patients facing major amputation. Advanced wound care involving the use of vacuum assisted closure (VAC) and maggot debridement therapy (MDT) as well as ultrasonic debridement, orthotics and off loading are used to achieve soft tissue healing and functional rehabilitation.

Risk factor modification as well as supervised exercise in patients with peripheral vascular disease is essential. More discussion to improve the quality and integration of care in limb salvage in Singapore and Asia is needed.

S4 Acute Care Surgery: An Emerging Specialty

Li Tserng Teo
Consultant, General and Trauma Surgeon, Department of General Surgery, Tan Tock Seng Hospital, Singapore
Director, Surgical High Dependency Unit, Division of Surgery, Tan Tock Seng Hospital, Singapore

Changes in our medical education programme and training structure has led to early sub-specialisation in surgeons. Acute care surgery is a new emerging speciality that not only encompasses the technical aspects of emergency surgery but also that of managing the critically ill patient medically. It has become a recognised speciality in North America. What is acute care surgery? Do we need such a new speciality in Singapore?

S5 Don't Miss the Cancer! – Tips from the Breast Radiologist

Jill Wong
Department of Oncologic Imaging, National Cancer Centre, Singapore

Breast cancer is a common disease and is frequently diagnosed by mammography. Unfortunately, breast imaging has gained the reputation of being a specialty prone to litigation as it is easy to miss a breast cancer when the imaging features are less typical. Several cases are shown of “near misses” with teaching points to illustrate pitfalls for the unwary.

S6 Don't Miss the Cancer! – Tips from the Surgeon

Mona Tan
Consultant, Breast and Endocrine Surgeon, Mount Elizabeth Novena Hospital, Singapore

Surgeons form the primary point of contact with patients and are therefore considered coordinators of almost all the aspects of patient care with regards to the treatment of breast cancer. We thus have to be familiar with the limitations and possible pitfalls of each point of care as treatment outcomes are only as strong as the weakest link. Practical examples are provided as an aid to identify the potential gaps in care and how these may be minimised.

S7 Don't Miss the Cancer! – Tips from the Breast Pathologist

Puay Hoon Tan
Senior Consultant Histopathologist & Head, Department of Pathology, Singapore General Hospital, Singapore

Breast cancer diagnosis is a multidisciplinary team effort. While the ultimate diagnostic pronouncement of cancer is the domain of the pathologist, an accurate determination is foremost dependent on the biopsy material that is submitted to the pathology laboratory.

There can be several perspectives when one discusses how not to miss a breast cancer. In a pathologist's environment, it would entail familiarity

with histological criteria for recognising cancer, which in most instances will be fairly routine and straightforward. There are situations however, where malignant lesions can mimic benign conditions microscopically, and this is when the pathologist can avoid underdiagnosis through a combination of experience, appropriate level of suspicion with recourse to ancillary diagnostic tools, and close clinical-radiological-pathological correlation.

Preoperative core biopsies are current standard practice in evaluating breast lesions. There are occasions where the pathological conclusion on a core biopsy is benign, yet there is a distinct possibility of cancer in unsampled parts of the lesion. From the surgeon's stance, it is important to be aware of such conditions so that cancer that is potentially present is not missed from lack of follow-through with complete excision.

Apart from atypical ductal hyperplasia and lobular neoplasia, benign conclusions on core biopsies for papillary tumours, radial scars, mucocele-like lesions and fibroepithelial neoplasms may herald more sinister changes which are not reflected on the initial core biopsies. These breast lesions, despite absence of established malignancy in core biopsy material, necessitate multidisciplinary discussion with careful review of clinicoradiological features, so that further excision can be recommended for detailed histological assessment to avoid missing a malignancy.

S8

An Aesthetic Breast after Cancer: Breast Reconstruction after Mastectomy – State of the Art

Bien Keen Tan, Yee Siang Ong

Department of Plastic, Reconstructive and Aesthetic Surgery, Singapore General Hospital, Singapore

In Singapore, the majority of breast reconstructions are now done immediately after skin sparing mastectomies. More than 95% of our reconstructions are in the immediate setting. Based on this series of 350 patients, we outline our approach to providing safe and expeditious reconstruction that will allow patients to continue oncological treatment, ie, chemo/radiotherapy.

Three major reconstructive options are outlined: 1) Two-stage implant reconstruction, 2) Latissimus

dorsi reconstruction with or without implant and 3) Transverse rectus abdominus myocutaneous flap or Deep inferior epigastric perforator flap. Secondary adjunctive procedures such as nipple reconstruction and fat transfer are described.

The diagnosis of cancer stirs a mixed bag of emotions. We aim to minimise the physiological burden patients experience so that the full benefits of immediate breast reconstruction are realised.

S9

Surgical Issues in Neoadjuvant Chemotherapy for Operable Breast Cancer

Yah Yuen Tan

Mount Elizabeth Medical Centre, Singapore

Breast cancer is the most common cancer amongst women in Singapore. For the increasing numbers of young women being diagnosed with breast cancer, breast conservation therapy is often the preferred option. Neoadjuvant chemotherapy (NAC) to downsize the tumour is one of the strategies that may be employed to enable successful breast conservation. The talk will discuss the relative indications/contraindications of NAC and surgical issues including preoperative planning, surgical techniques, margins and outcome.

S10

Oncoplastic Techniques in Breast Conserving Surgery

Ching Wan Chan

Consultant, Department of General Surgery, University Surgical Cluster, National University Health System, Singapore

The treatment for breast cancer has undergone radical change in the past 3 decades. From the early days of the Halsted's mastectomy and radical mutilating surgery, much has changed. In the early seventies, surgeons began questioning the benefit of such morbid and disfiguring surgery, and with rapid improvements in adjuvant therapy, surgery was able to evolve towards breast conservation.

However, even then, the proportion of women who were eligible for breast conservation was few, but with the introduction of nationwide screening programmes, breast conservation surgery became the option of choice.

In these days, women are living longer and better lives after a diagnosis of breast cancer, and the psychosocial implications of having a physically deformed breast after treatment begins to exert greater influence on the mental well-being of our patients.

Most of us do recognise that patients with a positive outlook are best equipped to deal with the changes and stresses that a diagnosis of breast cancer imposes. If the operation for cancer does not make them feel less of a woman, and better—makes them feel better about themselves, it is a bonus in this difficult journey.

Oncoplastic surgery is a combination of oncologic resection of the cancer with reconstruction of the breast using plastic surgery techniques. Depending on the complexity of the surgery, they can be performed with sufficient training or together with our plastic surgery colleagues.

We are all familiar with the concepts of volume displacement and volume replacement for breast surgery. Oncoplastic surgery as a whole can encompass this entire spectrum, as surgeons are not only focusing on the cancer, but also on preserving the form of the patient. In its most distilled form, the techniques which most surgeons would consider as the workhorse of oncoplastic surgery are the mammaplastic techniques long used by plastic surgeons for breast reductions. By adapting these techniques, the breast mound can be mobilised and remodelled after cancer resection in order to recreate a new breast.

S11 Transanal Haemorrhoidal Dearterisation (THD) for Treatment of Piles: A Better Option?

Kheng Hong Ng
Consultant Surgeon, KH Ng Colorectal and Minimally Invasive Surgery, Gleneagles Hospital, Singapore

Many modalities have been used in the treatment of first and second degree piles, including medications, rubber ligation and sclerotherapy. Surgical excision is performed if non-surgical options failed to address the problem. A newer technique of transanal haemorrhoidal dearterisation (THD) has gained popularity in the treatment of early stages of piles over the past 5 years. This technique involved the ligation of the distal branches of the superior rectal

artery and thus drastically reducing blood supply to the haemorrhoidal plexus. This, in turn, reduces the haemorrhoidal congestion with the result of decreasing haemorrhoidal bleeding and prolapse. The use of a transanal vascular doppler allows precise stitching of the haemorrhoidal vessels at or above the level of the anorectal junction. Unlike rubberband ligation of piles, this procedure does not produce the distressing sensation of tenesmus. It is a relatively painless procedure as the ligation of vessel is proximal to the dentate line and transitional epithelium of the anal canal. A haemorrhoidopexy can also be performed if there is a small component of haemorrhoidal prolapse. Many recent studies have shown that THD is very effective for treating bleeding piles that are not responsive to conservative treatment options. THD is less effective for third degree piles, especially if the predominant symptom is prolapse and not bleeding. However, THD can still be offered to patients with third degree piles and who refused excisional haemorrhoidectomy.

S12 Video Fistulography/Difficult Fistulas

Kok Yang Tan
Consultant & Associate Programme Director of General Surgery, Department of Surgery, Khoo Teck Puat Hospital, Singapore

Fistula-in-ano is a common surgical problem. These fistulous tracts may be simple or complex and traverse various components of the anal sphincter making management difficult in some cases. Successful management demands control of infection, proper delineation of the anatomy and successful management of the internal opening and fistulous tract. Options for surgical management include fistulotomy, advancement flaps, fibrin glue, collagen fistula plug, ligation of the intersphincteric fistula track. Video-assisted anal fistula (VAAFT) treatment has recently been made available in Singapore. This presentation explores and compares the results and introduces the modality of VAAFT.

S13

Faecal Incontinence Surgery

Mark Wong

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Director, SGH Pelvic Floor Disorder Service, Singapore General Hospital, Singapore
Assistant Professor, Duke-NUS Graduate Medical School, Singapore

Faecal incontinence (FI) is a potentially devastating condition that can significantly affect the quality of life of affected individuals. Surgery is indicated when conservative methods have failed (such as dietary modifications, medications, biofeedback therapy, anal plugs and irrigation) or when surgery is the only option (trauma causing extensive soft-tissue damage; after abdomino-perineal resection).

The available techniques include traditional anal sphincter repair, injectable bulking anal implants, sacral neuromodulation, artificial sphincters, as well as the stoma. The modality of choice should be selected based upon the aetiology and severity of incontinence, as well the available surgical expertise.

Despite more than 20 years of innovation, FI remains a therapeutic challenge with surgical outcomes variable at best. Cost and expertise are significant limiting factors. No standardised selection criteria exists, underscoring the pressing need for robust data from randomised controlled trials and the training of more specialists in the field of pelvic floor disorders. As such, the eventual decision for surgery should be made in context of a multidisciplinary pelvic floor service, in order to optimise outcomes for the patients.

S14

Surgery for Rectal Prolapse – An Update

Jit Fong Lim

Gleneagles Medical Centre, Singapore

Surgery remains the cornerstone of treatment of rectal prolapse. Rectal intussusception, rectal mucosal prolapse and full thickness rectal prolapse are merely a continuum in the presentation of rectal prolapse sharing a common pathophysiology. However, there are 2 main schools of thought regarding the pathophysiology. One view is that rectal prolapse appears secondary to laxity of supporting structures of the rectum itself and hence treatment is focused on the rectum itself. The other

view is that rectal prolapse is secondary to laxity of supporting structures of the pelvis and not necessarily the rectum leading to treatments focused on support of the pelvic floor. Classic operations can be divided into trans-abdominal operations and trans-perineal operations. More recent developments include variations to these time-tested operations based on the belief that the pathophysiology is more likely to be laxity of pelvic organ and pelvic floor support. Choice of treatment is also affected by patient comorbidities, age and type of potential complications. An algorithm of treatment should be based on patient age, comorbidities and evidence of pelvic floor laxity.

S15

Component Separation Repair for Complex Ventral Abdominal Hernias

Aaryan Koura

Senior Consultant, Department of General Surgery, Tan Tock Seng Hospital, Singapore

Complex and recurrent ventral abdominal hernias are a difficult surgical problem due to the high rates of hernia recurrence. Component separation has been used as a means to reduce tension in the hernia repair and possibly reduce recurrences.

S16

NOTES, SILS, SPA. Where Are We Today? And Where Are We Going Tomorrow?

Asim Shabbir

Consultant Surgeon, Division of Upper Gastrointestinal Surgery, University Surgical Cluster, National University Hospital Singapore, Singapore
Postgraduate Director, Department of Surgery, University Surgical Cluster, National University Hospital Singapore, Singapore

Globally, millions of laparoscopic procedures are performed. The trend has been towards performing them by lesser and lesser invasive approach and fewer scars. An extension of the trend is to perform operations with least visible scars. There are reliable and simpler equipment available for these procedures and an increasing demand has driven the innovation and availability of newer tools. A number of advantages have been proposed related to this approach including cosmesis, decreased pain and wound complications along with the ability to convert to standard multiport laparoscopic surgery, if needed. Although single incision laparoscopic surgery (SILS) seems to be promising and offers

potential benefits for patients compared to conventional laparoscopy, there are possible disadvantages. It may not allow the same level of manual dexterity, technical performance and the long-term risk of hernia is yet to be established.

The evolution of surgery toward less invasive approaches has acted as stimulant effect towards the development of new less invasive techniques in entering the abdominal cavity. The most prominent techniques representing scarless surgery is natural orifice transluminal endoscopic surgery (NOTES). As NOTES struggles with technical and equipment difficulties, we look ahead to technology and training for making true scarless surgery a reality. Until then, SILS seems to be more ready for wider use.

S17 Resection for Hepatocellular Carcinoma

Pierce Chow

Professor, Duke-NUS Graduate Medical School, Singapore
Senior Consultant & Head, Department of General Surgery, Singapore General Hospital, Singapore
Visiting Senior Consultant, Department of Surgical Oncology, National Cancer Centre, Singapore

The Asia-Pacific bears the largest portion (70%) of the global burden of hepatocellular carcinoma (HCC) mainly because of the high incidence of chronic viral hepatitis in this part of the world. Surgical resection is the main modality of curative therapy. Survival in inoperable patients, especially in those with poor liver function remains grave.

While surgical resection confers consistently better survival than non-surgical therapy, there is poor consensus on what constitutes operable HCC. In particular, the practice guidelines of the American Association for the Study of the Liver (AASLD) differ significantly from that of the Asia-Pacific Association for the Study of the Liver (APASL).

While larger and multi-focal HCCs do poorer, tumour burden by itself may, however, not be the only criterion of long-term outcome after surgical resection. Long-term overall survival of patients with HCC within the Milan criteria treated by surgical resection have been reported to improve in recent years. In addition, there is increasing evidence that down-staging of large or marginally operable HCC is a feasible multidisciplinary option.

We have systematically reviewed the outcomes of surgical resection for HCC in patients with good liver function and meeting the Milan criteria for early HCC, published in the last 10 years. This will be discussed together with data reflecting the Singapore General Hospital experience.

S18 Recent Updates on Resection of Non-Colorectal and Non-Neuroendocrine Liver Metastasis

Kui Hin Liau

Senior Consultant Surgeon, Nexus Surgical Associates, Mount Elizabeth Medical Centre & Hospital, Singapore

Conventional belief of non-colorectal and non-neuroendocrine liver metastases (eg, breast) carries a grim prognosis. This belief has resulted in the notion that more aggressive treatment strategy is unlikely to contribute to long-term survival and palliative treatment is the optimal choice for this group of patients. In the past 25 years, aggressive treatment strategy with the application of novel targeted molecular therapy, in selected patients, has resulted in improved long-term survival outcome. This lecture discusses the role of surgery in the treatment of single or multiple non-colorectal and non-neuroendocrine metastatic lesions restricted to a single or limited site and the impact of aggressive treatment on patient's long-term survival.

S19 Single Port Laparoscopic HPB Surgeries –Tips to Learning Curve

Stephen Chang

Consultant, Division of Hepatobiliary and Pancreatic Surgery, Department of Surgery, National University Hospital, Singapore

In recent years, much interest has been generated in the area of single incision laparoscopic surgery (SILS) albeit the lack of clear evidence of its benefits. This is partly driven by perceived benefits by the patients who are on the “receiving” end of the surgeries.

Unlike natural orifice transluminal endoscopic surgeries (NOTES), SILS can potentially be as safe as conventional laparoscopic surgeries. Whilst NOTES requires infringement of natural protective luminal wall which is thus not at all natural (it is therefore a misnomer!), SILS, if done through the umbilicus, simply temporarily “reopens” the natural

embryological defect that had allowed the body to gain access to the outside world!

Given that less port sites are required in SILS, potentially less port site adhesions will occur and thus there is a theoretical benefit in SILS if a long enough follow-up period is being observed and provided the surgery can be done safely.

Safety is thus paramount if SILS is to stay in our practice of surgery. Conventional laparoscopic surgery, when first started, had similar label of “unsafe surgery”; with movements of the instrument tips directly opposite to the handle movements, traditional surgeons must have ridiculed its beginnings. As history has proven, with greater understanding of the techniques, better instruments, and proper proctoring, laparoscopic surgery has shaken off its image of being “unorthodox”. SILS similarly needs to go through this phase of acceptance.

In our unit, SILS was first adopted in 2008 with the initial cases performed via a three-port fascial puncture technique through a single umbilical skin incision. Later, our unit was the first in Asia to adopt the use of SILS access device. Since then, various such access assist devices as well as instruments tailored for the SILS approach had been produced which helped complement the development of technique in SILS. At the same time, numerous international workshops were organised to discuss and share experience in this new approach.

Cholecystectomy was the first procedure in our unit to adopt the SILS approach. After gathering experience of nearly 100 SILS cholecystectomies by a fairly consistent team, along with the near 100 case experiences of conventional laparoscopic liver resections, we started performing SILS in liver procedures such as SILS liver biopsy, cysts deroofting and eventually SILS liver resections in a very highly selected group of patients. With greater familiarity of the technique, we have since embarked on SILS distal pancreatectomies. We have no complications in our experience although we have a respectable conversion rate of 6%, with additional ports in the first 100 cases of SILS cholecystectomies.

The factors contributing to the success of a safe learning curve can therefore be summarised as follows: a consistent surgical team, adoption of new instruments, a conscientious review and

modification of technique, a step wise approach to adopting new procedures for SILS, and a proper proctoring and frequent communications with fellow surgeons performing this procedure.

S20 The Use and Benefit of Seprafilm in Open and Laparoscopic Colorectal Surgery

Francis Seow-Choen

Medical Director, Fortis Colorectal Hospital, Singapore

Adhesions are associated with a variety of factors during or after surgery: tissue manipulation, excessive desiccation, abrasion, use of electrocautery, innumerable foreign particles eg. sutures and powder, infection, blood, use of radiation therapy and intra-peritoneal chemotherapy. Adhesions lead to small bowel obstruction, infertility, chronic pelvic pain and increased difficulty for subsequent surgeries.

Thirty-five percent of 29,790 patients were readmitted within 10 years following open abdominal or pelvic surgery, with each patient readmitted an average of 2.1 times according to a 1999 report. Seventeen percent of open colorectal surgery patients will be hospitalised for intestinal obstruction within 2 years of the index procedure, with 20% requiring surgical management in another report in 1999.

Fifty one percent of Seprafilm-treated patients were free of adhesions. In addition, only 6% of control patients were adhesion free at ileostomy takedown, Seprafilm patients were 8.5 times more likely to be free of adhesions. In another study, Seprafilm was effective in reducing 47% of adhesive small bowel obstruction. We have also found that Seprafilm reduced peristomal adhesions and facilitates early closure of defunctioning ileostomies.

Post-laparoscopic rectal surgery is still associated with some degree of pelvic adhesions which may result in intestinal obstruction and need for re-operation. The use of Seprafilm during laparoscopic colorectal surgery is useful and should be considered for patients to prevent postoperative adhesive problems.

S21 Scarless-in-the-Neck Endoscopic Thyroid- ectomy (SET)

Charles Tan

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National University Hospital, Singapore
Assistant Professor of Surgery, National University of Singapore
Yong Loo Lin School of Medicine, Singapore

Our NUH experience is 79 cases over an 8 year period. Median age of patients is 40, 95% female. All cases we operated on with benign preoperation biopsies. The approaches include all ports in the axilla, axilla/breast and axilla-single port. The median operative time was 130 minutes. There were 5 cases which were converted to conventional surgery. Median length of stay was 1.5 days. Postoperative morbidity were 2 cases of chest bruising, 1 transient neuropraxia, and 1 subcutaneous emphysema.

S22 Robotic Neck Dissection

Ranjiv Sivanandan

The Thyroid Head & Neck Surgery Centre, Mount Elizabeth Medical
Centre, Singapore

The most recent development in the use of robotics in head and neck surgery is in performing neck dissections for metastatic neck disease, in particular for papillary thyroid carcinoma. Benefits of the robotic approach are primarily in preserving the aesthetic appearance of the neck and upper neck sensation. We describe the technique of robotic modified radical neck dissection via the trans-axillary approach, our local experience and review the preliminary literature on its safety and efficacy in comparison to conventional open neck dissections.

S23 Sleeve Gastrectomy: Is It as Easy as It Seems?

Andrew Wong

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Hospital, Singapore

The use of laparoscopic sleeve gastrectomy as a one-stage definitive weight-loss surgical procedure has increased exponentially in recent years not just in Singapore but also in the rest of the world. On the surface, it appears to be an easy enough operation to

perform with an acceptable risk profile, achieving almost similar results to gastric bypass surgery in terms of weight-loss and comorbidity resolution. However, almost a decade and many sleeve gastrectomies later, the experts agree that while this is a good weight-loss operation, much attention to detail is required to ensure good outcomes in weight-loss and comorbidity data as well as low complication rates.

S24 Bariatric Surgery in the Private Sector

Melvin Look

Consultant, Mount Elizabeth Medical Centre, Singapore

Medical practice in Singapore is clearly divided into the public and private sector. Bariatric surgery is conducted equally in both types of institutions, and there is no superior model for an ideal practice. An ideal operation does not exist either, and should be tailored to the specific situation, patient and surgeon.

Bariatric surgery in the private sector tends to be focused on individual surgeons, rather than be team-based or programme-based. The system is patient centric and time efficient. There is little need to consider academic, teaching or research requirements.

The cost of bariatric surgery in private practice is far higher than in the public hospitals. There is no government subsidy and medical insurance plans often do not pay for procedures related to weight loss.

Private surgeons tend to be more experienced than public sector surgeons, but they have low volumes practices which may impact negatively on outcomes. The patient profile may differ in terms of BMI, age and associated morbidities. Many are self referred and have done extensive research on the internet. In comparison, a significant number of public sector patients are referred from primary care, screening programmes and the uniformed service. A significant proportion of private sector patients are foreigners from neighbouring countries. This presents special challenges in the after-care and may influence the choice of procedure selected.

An increasing number of patients are presenting to the private sector for revisional surgery after complications related to a primary bariatric

operation done elsewhere. These operations can be difficult and technically demanding.

S25

Robotic/Single Port Surgery

Bernard Lim

Consultant Surgeon, Paragon Medical Centre, Singapore

Robotic colorectal surgery has been an emerging aspect of laparoscopic surgery progressing, likewise, the role of single port laparoscopic colorectal surgery has also been recently explored. Robotic surgery has also been combined with single port surgery. Is it all hype? Or is there a definite role? Looking at the available data, it has been shown to be safe and feasible. Let us take stock of the progress thus far. Robotic and single port laparoscopic surgery does not aim to replace conventional multiport laparoscopic surgery, but serves to further expand the range of tools a colorectal surgeon has in his armamentarium.

S26

Clinical Trials for Treatment of Advanced Gastric Cancer

Jimmy So

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Yong Loo Lin School of Medicine, Singapore

Gastric cancer remains a major cause of cancer death worldwide. Stage-orientated treatment of gastric cancer is currently a standard practice. For early stage gastric cancer, minimally invasive treatment such as endoscopic submucosal dissection or laparoscopic surgery is possible. For more advanced cancer, combined radical surgery with adjuvant therapy can provide a better outcome for those patients. However, the best method of reconstruction remains unknown. We are currently conducting a multicentre randomised trial comparing Rou-en-Y versus Billroth II gastrojejunostomy to assess the patient's outcome and quality of life. For locally advanced disease, we recently completed a phase 2 neoadjuvant study using docetaxel, cisplatin and capecitabine with promising results. The toxicity was acceptable and patients with good pathological response had significant better survival. For metastatic gastric cancer, the role of surgery is controversial. There is an ongoing randomised study

comparing reductive gastrectomy with chemotherapy with chemotherapy alone and we have just started recruitment in Singapore. In addition, certain molecular subtypes of gastric cancer may be treated with specific targeted therapy such as trastuzumab for HER2-positive tumours. With the development of gene expression microarray analysis, we can now study the individual tumour's gene expression. These techniques identify distinct molecular subtypes of gastric cancer, with reliable prognostic information and prediction of response to various chemotherapeutic drugs. We have initiated a phase 2 clinical trial, the Genomic Guided Gastric (3G) cancer study to test this concept. In this study, patients with metastatic gastric cancer will be treated with either S1 and oxaloplatin or S1 and cisplatin based on their genomic profiles. Recently, intraperitoneal (IP) chemotherapy has showed promising results for patients with peritoneal disease; a clinical trial using both IP and systemic chemotherapy will start at NUH soon. We hope that all these efforts will improve the care of our patients.

S27

Role of MIS Oesophagectomy and Managing Anastomotic Leaks

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The development of minimal invasive surgery (MIS) in the last couple of decades has advanced in leaps and bounds with most reporting improvement in patient care and quality of life without compromising surgical techniques or results. The benefit is evident with smaller wounds, earlier recovery and mobilisation, less pain, lower incidence of wound infection and of course better cosmesis. Traditionally in the area of open resectional surgery for oesophageal cancer, this involves a long midline upper abdominal incision and a right thoracotomy with respiratory morbidity reported in excess of 45%. With the approach of MIS in oesophagectomy, this has led to a reported improvement to as low as 20% and minimal wound complications. Evidence is also appearing which reports improved long-term quality of life (QoL). The overall survival and disease free survival or patterns of tumour recurrence are no different between open resection or MIS. Respiratory complication is a large component of morbidity but other notable risks are chyle leaks, anastomotic leak

and mortality of 5%. This presentation will highlight the MIS technique with review of current practices and results as well as prevention of potential complications and its management.

S28

Current Management of GIST

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Gastro-intestinal stromal tumour (GIST), though a relatively rare tumour, is the most common mesenchymal tumour of the gastro-intestinal tract. It is typically characterised by its immunohistochemical staining for cKit (CD117), with 90% expressing cKit mutation. The most common site of GIST is stomach (60%) and less common sites are oesophagus and rectum. Surgical resection remains the mainstay of treatment for localised GIST. The aim of surgery is to achieve complete gross negative resection margin without rupturing the tumour. Generally for gastric GIST, wedge resection is adequate and formal partial or complete organ resection is not required. Lymphadenectomy is also generally unnecessary. This often can be achieved by laparoscopic approach with comparable short-term outcome when compared to open surgery. However long-term oncologic outcome, particularly with high risk GIST remains unknown as the follow-up period is still relatively short. Postoperative adjuvant therapy with imatinib for intermediate to high risk patients is well established but the optimal duration of treatment is still under evaluation. For metastatic and locally advanced unresectable GIST, the use of neoadjuvant therapy using imatinib remains investigational but in highly selected patients, long-term survival outcome may be achieved.

S29

Living Donor Liver Transplantation for Hepatocellular Carcinoma – Pushing the Boundaries

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Hepatocellular carcinoma (HCC) is the second most deadliest cancer in the world and is the tenth most common cancer among Singaporean men. The risk factors for developing HCC are well documented. The main risk factor is liver cirrhosis and the main cause of liver cirrhosis and liver cancer in South East Asia is the Hepatitis B virus. Other risk factors include Hepatitis C and alcohol.

Liver transplant emerges as an option for patients with liver cancer and liver cirrhosis as it has an added advantage of removing the diseased liver and relieving portal hypertension. Due to limited organ availability, several criteria were developed in order to control the use of cadaveric liver and the 2 most common are the Milan and UCSF criteria. However, in recent times, a lot of centres are expanding these criteria especially in centres doing living donor. Several studies have found that the results were similar for patients within these criteria or outside. Moreover, living donor is a “private” gift and does not deplete the cadaveric organ pool but in fact will help relieve it.

Many other criteria which are more inclusive have cropped up in recent years, for example, the ‘Rule of Seven’ criteria from Hong Kong. But the safety of the living donor is of paramount importance. No compromise of this healthy donor should be tolerated. At the same time, informed consent for both the donor and recipient must be extensive and thoroughly reviewed by both of them as well as independent ethics committee.

In conclusion, with better surgical technique and better immunosuppression, living donor liver transplantation is a viable option for patients with HCC.

S30

Emergency Laparoscopic Colorectal Resections

Dean Koh

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Over the past decade, several large randomised prospective studies have demonstrated the short-term benefits of laparoscopic over open colectomy in the elective management of both benign and malignant conditions. These advantages included earlier return of bowel function, lower rates of postoperative complications, reduced pain scores and shorter lengths of hospital stay.

However, the role of laparoscopic colectomy in emergency conditions remains controversial with limited data available in the literature. This talk aims to describe the experience of performing laparoscopic colectomies for emergency conditions by using case examples and video clips. Data from a study aimed at comparing the outcomes of a case matched series of laparoscopic emergency and elective colectomies will also be presented. In essence, current data supports the performance of emergency laparoscopic colectomy in a carefully selected patient group. Although the operative times were longer, the various postoperative outcomes were comparable to that of the open technique. The laparoscopic group did not incur a higher cost.

S31

Laparoscopic Colorectal Surgery – Where Are We Now?

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Laparoscopic colorectal surgery has come a long way since it was first attempted a little more than 20 years ago. After much initial skepticism, it has now emerged as standard of care for selected resectable malignancies. We review the evolution of this technique, the current evidence-base and its current applications.

The discussion will include the outcomes of laparoscopic resection for cancer and short videos on

common procedures, various variant techniques including hand port laparoscopy, single port laparoscopy and other novel techniques.

Participating Abstracts

P1

The Early South-East Asian Experience with Lateral Intercostal Artery Perforator Flaps, Partial Breast Reconstruction

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Introduction: Breast conservation surgery (BCS) followed by radiotherapy is an equally viable option as mastectomy as the treatment of choice for early breast cancer. As overall survival of patients has improved over the years due to advances in adjuvant treatment, aesthetic outcome has evolved as a determinant of a successful BCS apart from oncological clearance. Tumour to breast size ratio determines if BCS will achieve an acceptable cosmetic outcome. Our Asian patient profile includes that of an average A/B cup size which proves BCS challenging and requiring a mastectomy instead. The lateral intercostal artery perforator (LICAP) flap is particularly suitable to allow for immediate partial breast reconstruction in selected patients after BCS.

Methods: A retrospective review was conducted of all patients who underwent breast reconstruction with the LICAP flap at the Khoo Teck Puat Hospital. Using patient demography, procedures and outcomes, we describe this relatively new technique not yet widely used in breast reconstruction in Asia.

Results: Our series of 3 women with early breast cancer underwent BCS followed by immediate breast reconstruction with the LICAP flap. Two of them were immediate reconstruction while the other was an immediate delayed reconstruction. Follow-up period ranged from 3 to 12 months, with a median time of 4 months. There were no significant postoperative complications or need for re-operation.

Conclusions: Our series of 3 patients demonstrate that this technique is a good option in the Asian patient with small breasts and laterally located tumours. LICAP achieves breast conservation with excellent cosmesis.

P2

Single Modality Blue Dye is Sufficient for Sentinel Lymph Node Localisation in Breast Cancer

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Introduction: Sentinel lymph node (SLN) biopsy is the standard of care for early stage breast cancers. Several groups have reported superior results with the use of dual modality (blue dye and radiocolloid). In our institute, we routinely use single modality blue dye. In this study, we evaluate the outcome of this practice and compare it with reported studies using dual modalities.

Methods: Retrospective review was performed of 610 patients who underwent SLN biopsy using single modality blue dye at our institute from 1 January 2006 to 31 December 2010. Axillary lymph node dissection (ALND) was performed only when the SLN was positive.

Results: The SLN was not identified in 12 patients (2.0%). One of these patients had involved nodes on ALND. Two patients had undergone wide local excision in the upper outer quadrant of the breast; 1 patient had undergone repeated debridement for hidradenitis suppurativa. Median number of SLNs identified during each surgery was 2. A single non-SLN present in the axillary tail of the mastectomy specimen was found positive for metastases in 2 patients in whom the SLN was negative. Axillary nodal recurrence occurred in 1 patient who had undergone SLN biopsy alone. Three patients developed an allergic reaction. Two patients developed hives and a transient drop in blood pressure; 1 patient developed anaphylaxis and surgery was terminated to allow for stabilisation.

Conclusions: SLN biopsy using single modality blue dye produced results comparable to those reported with dual modality. The rate of non-identification and regional control was acceptable and allergic reactions were uncommon.

P3

Axillary Nodal Metastases from an Occult Breast Primary

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Introduction: Axillary nodal metastasis from an occult breast primary is uncommon. Prognosis is similar to Stage II node positive breast cancer. Because of the rarity, there are no guidelines regarding the best method of treatment of the ipsilateral breast. In this study, we review the treatment and outcome of a series of 4 patients managed at our institute.

Methods: Six female patients presented with an isolated axillary mass from 1 January 2003 to 31 December 2010. One patient was medically unfit for surgery and died soon after from end-stage renal failure and another patient defaulted treatment. Median follow-up was 24 months (16 to 90 months).

Results: Median patient age was 54.5 years (40 to 65 years). In all patients, no lump or abnormality was detected clinically or radiologically in the breast. The diagnosis of a breast primary was made on core biopsy, aided by a panel of immunomarkers. All patients underwent full axillary nodal dissection of the level I and II nodes. The ipsilateral breast was treated with mastectomy in 1 patient, wide local excision followed by breast irradiation (of indeterminate microcalcifications which were later proven to be histologically benign) in 1 patient and whole breast irradiation in 2 patients. All 4 patients have remained disease-free.

Conclusions: Axillary nodal dissection is recommended for all patients with an axillary mass from an occult breast primary. The outcome appears similar following either surgery (mastectomy or wide local excision) or whole breast irradiation alone.

P4

Risk Factors for Developing Metachronous Breast Cancers

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Introduction: Bilateral breast cancer can occur as synchronous or metachronous lesions. Metachronous lesions are associated with a poorer prognosis and are harder to detect. Our study aims to identify characteristics and risk factors for developing metachronous breast cancer.

Methods: Our retrospective study included all females treated in our institution for breast cancer from 2002 to 2009. Metachronous cancers were lesions diagnosed on the contralateral breast at least 6 months after the initial diagnosis. Exclusion criteria were metastatic disease, and patients who defaulted follow-up or died during the study period.

Results: Among 2621 patients with breast cancer, 101 patients had bilateral breast cancer. There were 60 (2.9%) with synchronous lesions, and 41 (3.0%) with metachronous lesions. The mean follow-up duration was 55.7 (5 to 182) months. The proportions of metachronous cancers detected within the first 2, 5 and 8 years were 29%, 65% and 93% respectively. The metachronous cancer was of a similar or lower stage in 78% of patients, and 4 patients already had metastatic disease at diagnosis. Although analysis of the group as a whole did not reveal significant risk factors, sub-analysis of only invasive cancers (35, 85.3%) revealed that a younger age ($P = 0.03$), Her2Neu over-expression ($P = 0.04$), ratio of positive to total nodes harvested ($P = 0.03$) and tumour size ($P = 0.04$) were associated with a significantly higher risk of metachronous cancer. Subsequent multivariate analysis only showed that a younger age ($P = 0.02$) and nodal ratio ($P < 0.01$) remained significant as independent risk factors for developing metachronous breast cancer.

Conclusions: Risk factors for developing invasive metachronous breast cancer include a younger age of diagnosis and a high ratio of positive to total harvested lymph nodes. Most of these lesions were diagnosed within 8 years of the initial diagnosis. This highlights the importance of surveillance post-treatment for breast cancer, especially within the first 8 years and for those with these risk factors.

P5

Predicting the Risk of Recurrence in Women with Stage III Breast Cancer

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Introduction: Disease recurrence is common in stage III breast cancer despite optimal treatment. In this study, we aim to evaluate possible predictors of recurrence, in order to identify a subgroup of patients who are at a particularly high risk.

Methods: Retrospective review was performed of 458 patients who were diagnosed with stage III breast cancer at our institution from 1 January 2001 to 31 December 2010. Recurrence (local or distant) was correlated with standard clinicopathological parameters.

Results: Those with stage III disease were 4 times more likely to develop recurrence ($P < 0.01$, OR 3.55, 95% CI 2.66 to 4.75) despite compliance to treatments. Twenty-three percent of (105 of 458) of stage III patients developed recurrence after a median follow-up period of 63 months. Disease was disseminated in 77%. Seventy-one patients died during the follow-up period. Recurrence risk correlated with high tumour grade, lymphovascular invasion, hormone unresponsiveness, and the extent of nodal involvement ($P < 0.05$). Those of Indian ethnicity were 5 times more likely to develop recurrence ($P < 0.01$, OR 4.74, 95% CI 2.14 to 10.48). This remained significant even on multivariate analysis. Oestrogen receptor (ER) negativity and the ratio of positive nodes to the total number of nodes harvested were also independent predictors of recurrence ($P < 0.05$).

Conclusions: The risk of recurrence remains significant in stage III disease despite compliance to recommended treatments. Indian ethnicity, ER status and the extent of nodal involvement were found to be independent predictors of recurrence. More intensive surveillance may be useful in this subgroup.

P6

The Role of Sentinel Lymph Node Biopsy in Breast Ductal Carcinoma-in-Situ

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Introduction: There is no consensus as to whether sentinel lymph node biopsy (SLNB) should be performed based on a preoperative diagnosis of ductal carcinoma-in-situ (DCIS). While SLN involvement is uncommon, a proportion of tumours contain invasive foci not present on biopsy. In this study, we evaluate the outcome of SLNB in patients with a preoperative diagnosis of DCIS and aim to identify those who will benefit from it.

Methods: Retrospective review was performed on 294 patients with a preoperative diagnosis of DCIS from 1 January 2001 to 31 December 2008. SLNB was performed in all cases where a mastectomy was performed. In cases of wide local excision, SLN was performed in cases deemed likely to have invasive disease, according to surgeon preference.

Results: Of 294 patients, 128 underwent SLNB. Five patients were found to have metastases in the SLN. Invasive disease was found on histological analysis of the surgical specimen in all 5 patients. We proceeded to evaluate factors that predicted for an upgrade of DCIS to invasive carcinoma. The presence of a mass on mammogram, suspicion of microinvasive foci on core biopsy and oestrogen receptor (ER) negativity were found to be significant on multivariate analysis.

Conclusions: In all cases where the SLN was positive, a final diagnosis of invasive disease was made. This suggests that SLNB should be considered in DCIS tumours which have a mass on mammogram, possible microinvasive foci on core biopsy and which are ER-negative since such tumours are likely to be upgraded to invasive carcinoma.

P7

Factors Other than Margin Status Predict for Recurrence in Borderline and Malignant Phyllodes Tumours

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Introduction: Borderline and malignant phyllodes tumours (PTs) have the potential for disseminated disease. Surgical resection with adequate margins is therefore advocated. However, there is no consensus as to what constitutes an adequate margin, and furthermore, recurrence and disseminated disease may still occur despite apparently complete resection. We aim to review the outcome of surgical resection of borderline and malignant PTs, as well as to identify factors that may predict for recurrence.

Methods: Retrospective review was performed of 56 patients diagnosed with borderline and malignant PTs at our institute from 1 January 2000 to 10 October 2011. All patients, except 1 with a malignant PT, underwent surgical resection. A margin of 1 mm was considered adequate.

Results: Of the 56 patients, 38 had borderline PTs and 18 had malignant PTs. There were 4 local recurrences in the borderline and 4 in the malignant group. There were 4 distant recurrences in the malignant group and none in the borderline group. There was no significant difference in the age at presentation. Older patients were more likely to develop recurrent disease ($P = 0.02$). A malignant histology ($P = 0.04$, OR 5.26, 95% CI 0.04 to 0.89) and high mitotic count ($P = 0.01$, OR 7.30, 95% CI 0.02 to 0.76) correlated significantly with the likelihood of recurrence. Although larger tumours were more likely to recur, this did not reach statistical significance. Margin status did not correlate with recurrence.

Conclusions: Recurrence following surgical resection with a 1 mm margin was 10.5% for borderline PTs and 27.8% for malignant PTs. Surgical margin status did not correlate with recurrence. Rather, age, malignancy and the degree of mitotic activity appeared to predict for recurrent disease.

P8

Primary Endocrine Therapy for the Elderly with Breast Cancer

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Majority of the cases were early stage cancer (23.9% DCIS, 28.6% stage I, 31.0% stage II). Transverse rectus abdominis myocutaneous (TRAM) flap reconstruction was most common and the majority (95.6%) were immediate breast reconstruction with a gradual decline in delayed reconstruction over the years. Serious postoperative complications were uncommon, with only 8.0% requiring surgery for early complications.

Conclusions: Breast reconstruction is a safe procedure but it remains less common amongst Singaporean women. However, there is increasing trend towards postmastectomy breast reconstruction with good outcomes in recent years. Perhaps, we need more efforts to raise awareness of breast reconstruction as a treatment option.

P9

Are Singaporean Women More Receptive Towards Breast Reconstruction for Breast Cancer – A 10-Year Review

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Introduction: Asian women have lower rates of breast reconstruction compared to Caucasian women despite improvements in understanding breast cancer and its management. This study aims to determine the rate of breast reconstruction over a 10-year period, identify patient and clinico-pathological tumour characteristics that influence the receipt of breast reconstruction postmastectomy, as well as to study the patterns of different breast reconstruction options.

Methods: All patients with breast cancer and who underwent postmastectomy breast reconstruction in our institution between January 2001 to December 2010 were reviewed. Patient demographics, tumour characteristics, and treatment details including reasons for mastectomy, neoadjuvant chemotherapy,

types of breast reconstruction and postoperative outcomes were studied.

Results: A total of 4321 mastectomy operations for breast cancer were performed during the 10-year study period; of these women, 446 (10.3%) had breast reconstruction; 13 (3.2%) women who underwent mastectomy had breast reconstruction in 2001. This increased to 70 (15.1%) in 2010. The median age was 46 years old (22 to 70); 72.9% were married. Majority of the cases were early stage cancer (23.9% DCIS, 28.6% stage I, 31.0% stage II). Transverse rectus abdominalis myocutaneous (TRAM) flap reconstruction was most common and majority (95.6%) were immediate breast reconstruction with a gradual decline in delayed reconstruction over the years. Serious postoperative complications were uncommon with only 8.0% requiring surgery for early complications.

Conclusions: Breast reconstruction is a safe procedure, however, it remains less common amongst Singaporean women. However, there is increasing trend towards postmastectomy breast reconstruction with good outcomes in recent years. Perhaps, we need more efforts to raise awareness of breast reconstruction as a treatment option.

P10

Is There a Mismatch between Eligibility and Utilisation of Breast Conservation Treatment in an Asian Community?

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Introduction: We aimed to investigate the extent to which patients in a predominantly Asian patient cohort are eligible for breast conservation treatment (BCT) and if a mismatch between eligibility for and utilisation of BCT exists.

Methods: All patients treated surgically by a single surgeon at a private medical facility between 2009 and 2011 were included in the study. Patients were deemed to have successful BCT if they underwent breast conserving surgery with pathologic clear margins and completed all recommended adjuvant treatment.

Results: Of 168 women who underwent surgery for breast cancer during the study period, 147 had successful BCT, forming 87.5% of the cohort. Of the

12.5% who underwent mastectomy, half requested a mastectomy as a personal choice despite having no medical or technical contraindications to BCT. Of those who sought a second opinion because a mastectomy was previously offered, BCT was achieved in 75% of cases. In addition, BCT was successful in 81% of initially palpable lesions and 98% of screen detected lesions. This is comparatively higher than other reported series, where BCT was performed for between 28% to 63% of patients.

Conclusions: 87.5% of women diagnosed with breast cancer can undergo successful BCT. Based on current literature, there may be room for a potential increase in utilisation of BCT through patient education, multidisciplinary coordination and surgical technique modifications.

P11

Video-Assisted Anal Fistula Treatment (VAAFT) – a Local Centre’s Initial Experience with a New Method

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Introduction: Complex anal fistulas remain difficult and challenging to treat, with a myriad of methods developed to address them. The video-assisted anal fistula treatment (VAAFT) method developed and first described by Dr P Meinero is one of the methods employed to deal with this clinical entity. Here, we present and evaluate our centre’s initial experience with the VAAFT system.

Methods: Data was prospectively collected and analysed from consecutive patients undergoing VAAFT from February 2012 to May 2012. VAAFT was done using instruments and methods very similar to that described by P Meinero *et al.* Data collected include patient demographics, fistula characteristics and initial postoperative outcome.

Results: Six patients had VAAFT performed (all males, mean age 46.5 years) between February 2012 and May 2012. All had previous fistula surgery. Mean follow-up was 11.3 weeks. There were no complications. During this period of follow-up, 2 had documented healing and another 2 were deemed to have failed treatment with further surgery

undertaken/planned for. The last 2 patients are still being evaluated for complete healing.

Conclusions: The numbers in this series are low and longer follow-up is required. Our preliminary results suggest that while the success rate of treatment is not high, the procedure carries minimal morbidity to the patient (with no compromise of the anal sphincter complex), and can potentially treat complex anal fistula with a one-stage procedure.

P12 Neutrophil-Lymphocyte Count Ratio (NLCR) – a Predictor of the Severity of Appendicitis

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Introduction: Total white count has been used frequently as a marker of infection or inflammation. Likewise, neutrophil-lymphocyte count ratio (NLCR >10) is gaining popularity especially as a marker of severe infection or bacteraemia in critical care setting. We aim to assess the usefulness of NLCR in predicting the severity of appendicitis.

Methods: This was a prospective study involving 201 patients (n = 201) with appendicitis: median age 30 (16 to 81); 160 male and 41 female; duration of symptoms prior to presentation 1.9 days (1 to 14). All patients had undergone appendectomy and the decision for surgery was based on clinical assessment or radiological imaging for those with equivocal signs. Severe appendicitis was defined as perforated appendicitis or the presence of intra-abdominal free pus (n = 100). The NLCR, total white counts (TWC), lymphocyte counts and absolute neutrophil counts (ANC) were recorded. The sensitivity, specificity, positive predictive value (PPV) and negative predictive value (NPV) for the presence of severe appendicitis were calculated when compared to those patients with uncomplicated inflamed appendicitis (n = 101).

Results:

Parameters	NLCR >10	ANC >10 x 10 ⁹ /L	TWC >12 x 10 ⁹ /L
PPV	0.616	0.503	0.497
NPV	0.591	0.519	0.500
Sensitivity	0.53	0.75	0.82
Specificity	0.67	0.27	0.18

Conclusions: The NLCR appears to have a strong correlation with the severity of appendicitis and therefore this may be used to alert the surgeon preoperatively of the presence of appendicular perforation. It appears to have a better positive and negative predictive value for severity of appendicitis as compared to isolated TWC or ANC which are traditionally used as a marker of inflammation.

P13 Case Report on Management of Complete Anastomotic Stenosis Post Anterior Resection

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Introduction: Benign anastomotic stenosis is a recognised yet challenging complication post anterior resection. If a lumen is present, endoscopic balloon dilatation can be attempted. In cases with complete stenosis, correction may require surgery, often with creation of a permanent stoma. This video describes the endoscopic recanalisation and subsequent dilatations of a complete colorectal anastomotic stenosis following low anterior resection. The subsequent management of post-dilatation perforation with a covered colonic stent is also discussed.

Methods: Mr T, a 63-year-old Chinese, developed complete anastomotic stenosis, 4 months post low anterior resection for a rectosigmoid malignancy. The stenosis was first crossed with a tapered tip catheter, followed by a guidewire through to the proximal colon. A Spyglass catheter was then positioned and he underwent successful endoscopic balloon dilatation with a controlled radial expansion (CRE) balloon dilator. Three subsequent weekly dilatations were performed progressively up to 20 mm diameter. He was complicated by a small rectal perforation, for which he was treated with stenting using a covered retrieval stent.

Results: Two months post stenting, resolution of anastomotic stenosis was noted, and closure of his defunctioning ileostomy was planned, after retrieval of his colonic stent. However, sigmoidoscopy prior to surgery noted recurrence of his anastomotic stenosis. The patient underwent successful repeat colonic stenting and closure of ileostomy 1 week later.

Conclusions: The functional outcome after eventual closure of the diverting ileostomy was good and the colonic stent was then retrieved. Technical tips and lessons learnt from this total endoscopic approach to management of anastomotic stenosis will be highlighted.

P14

The Alvarado Score – A Clinical Stratification for Computed Tomography Evaluation in Suspected Appendicitis

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Introduction: Although computed tomography (CT) scan is useful in evaluation of suspected appendicitis, not all patients require CT evaluation. Clinical scores which identify patients who benefit from CT evaluation are immensely useful. We utilise the Alvarado Score (AS) to stratify patients with suspected appendicitis into subgroups who benefit from CT evaluation and propose an objective management algorithm for suspected appendicitis with AS guiding necessity for CT evaluation.

Methods: Retrospective review of medical records of all patients admitted for suspected appendicitis over a 6-month duration. Relevant data was recorded. The AS for each patient was determined retrospectively and correlated with histological and CT findings. The sensitivity, specificity, positive predictive value (PPV), negative predictive value (NPV), positive and negative likelihood ratio (LR) were determined for various AS and for CT.

Results: Three hundred and fifty-eight patients were studied with 167 males (46.6%) and 191 females (53.4%). Prevalence of appendicitis was 50% (179 patients); 214 patients (59.8%) had CT performed. Surgery was performed for 206 patients (57.5%). Overall negative appendectomy rate was 13.1%. Patients who underwent CT evaluation had a negative appendectomy rate of 5.7% compared to 17.9% in those without CT evaluation ($P = 0.009$). CT scan had a sensitivity and specificity of 92.6% and 96.9% respectively. AS of 4 or more had a sensitivity superior to CT (95.5%) while AS of 9 or more had a specificity superior to CT (100%).

Conclusions: In suspected appendicitis, the AS identifies a clinically equivocal group (AS: 4 to 8) which will benefit from CT evaluation. Incorporation of the AS in a management algorithm guiding CT utilisation will reduce negative appendectomy rates and cost.

P15

Single Incision Laparoscopic Right Hemicolectomy: A Single Centre Clinical Experience

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Introduction: Single incision laparoscopic surgery (SILS) is a new minimally invasive surgical technique which only makes use of a single umbilical incision, thereby minimising surgical trauma, postoperative pain, which ultimately facilitates fast recovery, decreases hospitalisation stay with a better cosmetic outcome.

Methods: SILS right hemicolectomy was performed for a 54-year-old patient with a 2 cm ulcerative mid-transverse colonic tumour. The procedure was performed via a single surgical port, composed of a wound protector and non-powdered latex gloves (in contrast to the conventional single port device), with an extra corporeal anastomosis.

Results: Total surgical time was 130 minutes and the patient was discharged on postoperative day 4. Histology confirmed that the oncological resection was complete. Zero out of the 15 lymph nodes was positive for malignancy.

Conclusions: SIL right hemicolectomy is a feasible, safe and accepted technique used in performing colectomy for oncological clearance. It is comparable to that of open surgery. A larger study will need to be done to further determine the benefits and outcome of patients undergoing SILS.

P16

Is Post-Concussion Syndrome Specific to Mild Traumatic Brain Injury?

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Introduction: We aimed to examine and to evaluate whether mild traumatic brain injury (MTBI) is an exposure for developing acute post-concussion syndrome (PCS) compared to other trauma.

Methods: The study is cohort prospective with Cox proportional hazard to avoid the overvalue of odd or risk ratio. One hundred seventy eight study participants recruited were from several hospitals in Jakarta and Palembang. They consisted of 78 MTBI who had loss of consciousness and met the criteria of MTBI; and 100 non-brain injured trauma patients who met the Abbreviated Injury Scale equal to MTBI, with characteristics presence of PCS, sex, age, work and insurance. All the MTBI patients had Galveston Orientation Amnesia Test at 24 hours after injury to meet MTBI criteria. Both participants had Rivermead Post Concussions Test to examine the presence of PCS.

Results: From both participants, 101 (56;7%) had PCS, and the proportion of PCS in MTBI patients was 76% and in non-brain injured trauma patients was 41% respectively. Patients with MTBI had risk ratio (RR) by 1876 (95% CI, 1.440 to 2.445) and sex had RR 1589 (CI 95%, 1265 to 1996) while age >40 years had RR 0,465 (CI 0,272 to 0,795) had *P* value 0,000. After multivariate analysis and controlled a potential confounder, the presence of PCS with *P* wald <0,05 MTBI had RR 1.750 (95% CI, 1.172 to 2614) and age had RR 1.894 (95%, CI 0.980 to 3.663).

Conclusions: Instead of the many controversies of the origins of PCS, the risk of acute PCS development in MTBI is 1.750 times compared to non-brain injured trauma, with age factor included. The differences between our study compared to other studies who found equal between MTBI and non-brain injured trauma, may be that our cases had virtually loss of consciousness, and excluded the confusing one which met MTBI criteria. Why non-brain injured trauma had high proportion of PCS may be that they also had MTBI without loss of

consciousness but confusion which was obscured by other trauma.

P17

Outcomes in the Elderly Who Sustain Traumatic Rib Fractures

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Introduction: Elderly patients with chest injuries are perceived to not be aggressively managed enough, for example through invasive ventilation or admission to an intensive care unit despite recommendations from ATLS guidelines. We audited the management of elderly patients who sustained chest injuries between 2004 to 2008 with respect to their initial management of their injuries and final outcomes.

Methods: We retrospectively analysed patient records from the trauma registry at the Sir Charles Gairdner Hospital whose inclusion criteria were age greater or equal to 65 between 2004 and 2008 who sustained rib fractures with ISS greater or equal to 15.

Results: We retrieved 41 out of 45 records which fit our inclusion criteria. There were 19 females and 22 males. Mean age was 76 years old. Mean ISS was 27.9. Nineteen out of 41 sustained pneumothoraces, 9 had haemothoraces and 14 sustained pulmonary contusions. Thirty-six presented with co-injuries including head injuries (n = 18), intra-abdominal injuries (n = 14), mediastinal injuries (n = 5), great vessel injuries (n = 2) and limb fractures (n = 16). Mortality was about 29% (n = 12) total, 25% (n = 3) of whom died in ED, 25% (n = 3) were palliated. Sixty-six percent (n = 8) died in the first 24 hours which were associated with head injuries, haemorrhage and cervical injury. The overall complication rate was 63.4% (n = 26).

Conclusions: Despite comorbidity differences between the elderly (≥ 65 years) and younger (< 65 years) populations, there was no difference in overall complication rates. The older population appeared to have a higher mortality rate. There appears to be no correlation between the number of rib fractures sustained and mortality. ISS scores of 31 to 60, bilateral lung contusions, motor vehicle accidents and pedestrian injuries, and presence of other non-rib fracture injuries are found to be positively associated with intubation and ICU admission.

P18

Outcomes of Osteomesh (Polycaprolactone) Versus Titanium Mesh in Orbital Floor Reconstruction: A Retrospective Review

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Introduction: A variety of alloplastic materials are currently in use for repair of orbital floor fractures. This retrospective analysis aims to compare the efficacy of osteomesh (polycaprolactone) versus titanium mesh.

Methods: This retrospective study included all patients who were admitted to Tan Tock Seng Hospital from January 2008 to December 2010 with orbital floor fractures requiring reconstruction with osteomesh or titanium mesh. Patients were analysed for patient demographics, cause of injury, preoperative eye symptoms, and postoperative complications.

Results: Thirty-six patients were included in this review. Minimum follow-up time was 1 year. Eighty-three percent (n = 30) had osteomesh reconstruction; 20% in the osteomesh group and 33% in the titanium group developed complications. Of those with osteomesh repair, 13% (n = 4) had enophthalmous, 0% had diplopia and 3% (n = 1) had implant infection. For patients with titanium mesh, 17% (n = 1) had enophthalmous, 33% (n = 2) had diplopia and 0% had implant infection.

Conclusions: Osteomesh is a reliable choice for orbital floor reconstruction with restoration of orbital volume for defects smaller than 2cm². In view of its osteoconductivity, further studies can be performed comparing its efficacy with non-resorbable alloplasts for defects of all sizes.

P19

The Utility of CT Thorax on a Background of Normal Chest X-ray in the Evaluation of Blunt Trauma

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Introduction: With the increasing use of computerised tomography (CT) scans in the initial evaluation of blunt trauma patients, radiological investigations like the chest X-ray (CXR) has been utilised less frequently. CT scans are expensive, increases radiation exposure and might not be likely to change clinical management in patients. The objective of this study is to evaluate the utility of CT thorax (CTT) on a background of a normal initial CXR after blunt trauma, and to assess in patients with a normal initial CXR if a subsequent abnormal CTT impacts clinical management.

Methods: We retrospectively reviewed all blunt trauma patients evaluated with an initial CXR from 2009 to 2011 in Tan Tock Seng Hospital, Singapore. Data was collected from the hospital's trauma registry and electronic records. Blunt trauma patients who received both CXR and CTT were included. Patients who had CTT done after a normal initial CXR were analysed for the presence of missed injuries leading to a change in clinical management.

Results: A total of 3896 cases were reviewed and 280 patients fulfilled inclusion criteria. One hundred and seventy seven had a normal initial CXR; 68 of these (38.4%) had an abnormal CTT. CTT changed clinical management in only 15 of these patients (8.4%): all 15 required chest tube insertion. One hundred and three had an abnormal initial CXR; 102 of these patients (99.0%) had an abnormal CTT. CTT changed clinical management in 44 of these patients (42.7%): 36 required chest tube insertions, 5 taken to the operating theatre, 2 had either a barium swallow or OGD, 2 had CT angiogram done, and 1 received mechanical ventilation. An abnormal CTT was significantly less likely to change clinical management in patients with a normal initial CXR (9.0% vs. 42.7%, $P = 0.009$).

Conclusions: The clinical utility of CTT on a background of normal initial CXR is limited. We

propose a diagnostic algorithm of obtaining CTT only in patients with abnormal initial CXR and in a selective group of patients. This can significantly reduce cost and effectively manage resources without adversely affecting clinical management. CXR is still a good initial screening tool to triage the need for a CTT to pick up severe life-threatening thoracic injuries and should not be discounted in this current day and age of advanced technology.

P20

Hypnosis in Surgical/Medical Procedures

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Introduction: Our purpose is to familiarise the audience with the use of hypnosis in surgical and medical procedures. A meta-analysis on the benefits of hypnosis for surgical patients indicated a very large effect size ($d = 1.20$). Benefits have included reduction in the amount of analgesia, reducing blood loss, more rapid wound healing, reducing postoperative complications, and length of hospital stay.

Methods:

1. Define and describe clinical hypnosis.
2. Provide a brief history and review efficacy.
3. Describe the procedure of hypnosis and illustrate/demonstrate how it is used in a number of surgical and medical procedures.

P21

Comparative Study of Laparoscopic Versus Open Gastrectomy for Early Gastric Cancer – A Single Surgeon Experience

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Introduction: Laparoscopic-assisted gastrectomy (LAG) has yet been widely adopted locally. We aim to compare the operative morbidity and oncologic outcomes between LAG and open gastrectomy (OG) in the management of early gastric cancer by a single surgeon.

Methods: A retrospective evaluation of our institutions database of patients with preoperative clinical diagnosis of early gastric cancer from 2002

to 2012. LAG was only started in 2007. Thus we compare LAG cases performed from 2007 onwards with OG cases performed prior to that.

Results: A total of 41 patients were compared (LAG, 22 patients; OG, 19 patients). There were no significant differences between the 2 groups (LAG vs. OG) in terms of age (median 67 vs. 70 years; $P = 0.41$) and gender (males: 68.2% vs. 57.9%; $P = 0.53$). Disease stage according to the TNM classification were similar in both groups (Stage 0: 0 vs. 2, Stage I: 19 vs. 13, Stage IIA: 3 vs. 4; $P = 0.22$).

Operative time was longer in LAG cases (305 ± 65.1 vs. 198 ± 47.2 min; $P < 0.001$). Patients that underwent LAG were started earlier on full feeds (4.2 ± 0.9 vs. 5.4 ± 0.8 days; $P < 0.001$) and diet (5.3 ± 0.9 vs. 6.4 ± 0.8 days; $P < 0.001$). Length of postoperative hospital stay was also shorter in the LAG group (6.7 ± 1.5 vs. 9.4 ± 5.1 days; $P = 0.033$).

The postoperative complication rates of the LAG and OG groups were 4.5% (1/22) and 21.1% (4/19) respectively ($P = 0.16$). There were no postoperative mortalities in either group.

No difference was found between the 2 groups in terms of the 5-year overall survival rate (100% vs. 78.9%, $P = 0.056$).

Conclusions: LAG is a good and safe alternative to OG for early gastric cancer. It offered equivalent operative morbidity and long-term survival with added benefit of faster postoperative recovery.

P22

Does Collatamp G Help Reduce Wound Infections? – Our Experience

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Introduction: Collatamp G is a gentamicin impregnated collagen matrix that is used as an adjunct for perioperative antibiotic prophylaxis. Locally, the postoperative wound infection rates are 2%, 10% and 30% for clean contaminated, contaminated and dirty infected wound classes respectively. We conducted a retrospective study to examine whether Collatamp G reduces postoperative infections in patients with these wound classes.

Methods: Retrospective study of 73 patients (54 men and 19 women; mean age 54 (range 29 to 88)

years who had undergone surgery between December 2009 to November 2011 in Tan Tock Seng Hospital had application of Collatamp G in their wound before closure. The primary endpoint was the development of any superficial wound infection within 1 month postoperatively. Thirty-six patients were in the clean contaminated wound class, 14 were in the contaminated wound class, and 23 were in the dirty infected wound class.

Results: Of the 73 patients, 11 (15%) developed a superficial wound infection; 4/36 (11%) of clean contaminated wounds developed infection; 2/14 (14%) of contaminated wounds developed infection; and 5/23 (21%) of dirty infected wounds developed infection.

Conclusions: Our data suggests that postoperative wound infection was only reduced in the group of patients with dirty infected wound class. More data with larger sample size will need to be studied to determine the role of Collatamp G in reducing wound infections.

P23

A Rare Cause of Haematemesis and Shock: Case Report of Spontaneous Intramural Oesophageal Dissection

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Intramural oesophageal dissection is a rare condition characterised by triad of chest pain, haematemesis and dysphagia and happens most commonly in elderly women with history of coagulopathy or treated by anticoagulants/antiplatelets. Although haematemesis is commonly seen, major bleeding with hypovolemic shock is unusual. We would like to report a case of intramural oesophageal dissection with haemorrhagic shock secondary to overwarfarinisation in a young male patient which was successfully managed with conservative treatment.

P24

Surgeon-Performed Ultrasound-Guided Fine-Needle Aspiration Cytology Shortens Time for Diagnosis of Thyroid Nodules

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Introduction: Ultrasound-guided fine-needle aspiration cytology (US-FNAC) of thyroid nodules is an important diagnostic procedure. In most hospitals, patients are referred to radiologists for US-FNAC, but this often results in a long waiting time before results are available. Surgeon-performed US-FNAC (SP-US-FNAC) during the initial patient consultation attempts to reduce the waiting time but it is not known whether this is as accurate as radiologist-performed US-FNAC (RP-US-FNAC). The aim of this study is to compare the clinical efficiency between SP-US-FNAC and RP-US-FNAC.

Methods: A retrospective study was performed on patients from the Department of General Surgery, Tan Tock Seng Hospital who underwent an US-FNAC from January 2011 to May 2012. All cases of SP-US-FNAC were performed by a single surgeon. Thyroid cytology reported as 'non-diagnostic yield', 'low cellular yield', 'inadequate', 'bloody' or 'cyst contents' were considered negative diagnoses. We compared the rates of positive diagnoses achieved by SP-US-FNAC and RP-US-FNAC. We also evaluated the interval from the time that an US-FNAC is ordered or performed in the clinic to that when a cytology result is finally available.

Results: Forty cases of SP-US-FNAC (from 39 patients) and 47 cases of RP-US-FNAC (from 43 patients) were included in this study. The mean size of thyroid nodules was 2.3 cm for SP-US-FNAC and 2.9 cm for RP-US-FNAC. SP-US-FNAC resulted in 29 (72.5%) positive diagnoses and 11 (27.5%) non-diagnoses while RP-US-FNAC resulted in 33 (70.2%) positive diagnoses and 14 (29.8%) non-diagnoses. There was no statistical difference between the rates of positive diagnosis for SP-US-FNAC and RP-US-FNAC ($P = 1.00$, Fisher's Exact Test). The median time taken to reach a cytological diagnosis was 1 working day for SP-US-FNAC (inter-quartile range: 25% = 1, 75% = 1) and 25 working days for RP-US-FNAC (inter-quartile

range: 25% = 16, 75% = 40) resulting in a significantly shorter interval to reaching a cytological diagnosis for SP-US-FNAC ($P < 0.001$, Mann-Whitney U Test).

Conclusions: In the workup of thyroid nodules, SP-US-FNAC is as accurate as RP-US-FNAC but significantly reduces the time taken to reach a cytological diagnosis. This leads to greater clinical efficiency in the management of patients with thyroid nodules which may in turn lead to other benefits such as decreased patient anxiety and increased patient satisfaction.

P25 Safety and Early Outcomes of Laparoscopic Sleeve Gastrectomy

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Introduction: Morbid obesity and its consequent obesity-related comorbidities are fast becoming a global epidemic. Laparoscopic sleeve gastrectomy (LSG), previously part of a staged procedure, has evolved into a stand-alone procedure for weight loss. Short-term outcomes have been promising and its relative safety as compared to other forms of metabolic surgery, have been discussed at international consensus summits. This study aims to examine the role of LSG in our local bariatric population.

Methods: A prospectively maintained database of patients undergoing LSG was analysed. Patient characteristics including body mass index, obesity-related comorbidities were examined. Outcomes including early morbidity, weight loss, and resolution of obesity-related comorbidities were studied.

Results: Thirty-three patients underwent LSG between March 2008 and May 2012. There were 13 males and 20 females, of average age of 41.8 (range 22.6 to 62.9) years, mean preoperative weight of 123.2 (range 83.4-165.1) kg, and mean body mass index (BMI) of 46.9 (range 33.7 to 60.8) kg/m². Obesity related comorbidities included diabetes mellitus (39%), hypertension (58%), hyperlipidaemia (36%), and obstructive sleep apnoea (33%).

At 3 months, 6 months and 1 year post-operation, the mean BMI was 38.7 kg/m², 36.6 kg/m² and 33.5

kg/m². There was an improvement in obesity-related comorbidities. One LSG was converted to open; no other complications were encountered.

Conclusions: LSG is safe and feasible, with low complication rates and satisfactory early weight loss. Further long-term studies are required to answer questions of long-term weight loss and late morbidities that may arise.

P26 Schwannomas: A Case Series of Rare Gastrointestinal and Retroperitoneal Schwannomas

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Schwannomas are generally slow growing, benign nerve sheath neoplasms, affecting mainly the extremities, head and neck, and trunk. Gastrointestinal schwannomas are rare, of which stomach tumours are the most common, but they comprise fewer than 0.2% of all gastric tumours. Colorectal schwannomas are very rare, occurring in less than 0.1% to 1% of all colorectal tumours, caecum being much more common than rectum. Retroperitoneal schwannomas are equally rare, occurring in less than 0.3% to 3.2% of all schwannomas. Patients usually present with a mass, abdominal distension or pain. Schwannomas are difficult to diagnose preoperatively due to non-specific radiological features. These tumours are best managed with resection.

As intra-abdominal schwannomas are rare, it is understandable that there are very few reported cases here. A literature review has revealed a case series of 12 gastrointestinal schwannomas for 1991 to 2006 and another case series of 7 retroperitoneal schwannomas for 1998 to 2004. We hereby present a series of 3 cases of rare gastrointestinal and retroperitoneal schwannomas.

With the recent advances in surgery, laparoscopic surgery has become commonplace. However, retroperitoneal schwannomas are still usually resected through open procedures due to its deep location. Laparoscopic resections, though reported worldwide, are still uncommon. We hereby present 1 case of laparoscopic resection of retroperitoneal schwannoma.

Case 1 reports a 52-year-old Chinese female who presented with an epigastric mass and underwent open duodenectomy, partial gastrectomy, Roux-En-Y gastro-jejunostomy for a duodenal GIST. Histology revealed a schwannoma.

Case 2 reports a 43-year-old Chinese male who presented with abdominal pain, had a pre-op biopsy diagnosis of retroperitoneal schwannoma and underwent a laparoscopic resection of retroperitoneal schwannoma.

Case 3 reports a 63-year-old Chinese female who presented with early satiety and anorexia, for which MRI imaging showed rectal cancer with lymphadenopathy. She underwent an anterior resection for supposed rectal cancer. Histology revealed a schwannoma.

P27

Local Experience of Endoscopic Stenting in Advanced Malignant Gastric Outlet Obstruction Patients

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Introduction: Endoscopic stenting is designed for palliation and prompt symptom relief of malignant gastric outlet obstruction, for which traditionally palliative surgical bypass or naso-jejunal feeding tubes are the methods of choice. This study reports our experience of endoscopic stenting in the palliation of malignant gastric outlet obstruction.

Methods: A retrospective review of 8 patients who underwent endoscopic stenting from April 2009 to May 2012 in our hospital by a single endoscopist was performed.

Results: Four male and 4 female patients with symptoms of nausea and vomiting were included. Their age range from 55 to 87 and median age is 85. Seven patients were diagnosed as gastric outlet obstruction secondary to advanced gastric cancer and 1 patient was diagnosed as pancreatic cancer complicated by duodenal stricture. Five patients opted for endoscopic stenting because they were not keen for surgery considering age and comorbidities. Two patients had concomitant hepato-biliary sepsis, thus not fit for operation. One patient aged 75 refused surgical bypass despite deemed fit. All

patients received WallFlex enteral duodenal expandable metal stent with anchor locks. Six of them had a 6 cm stent inserted. One patient had a 9 cm stent. One patient had a 6 cm plus a 9 cm stent because of the length of the stricture. All patients tolerated the procedure well without associated complications (eg. perforation or bleeding). Four patients were able to take soft diet and 3 were able to tolerate oral feeds after stenting. One patient was unable to tolerate feeds even after the procedure and was put back with naso-jejunal tube feeding. She was discharged to home hospice care and passed away 5 days later.

Conclusions: Endoscopic stenting is a feasible alternative palliative option for patients with malignant gastric outlet obstruction who refuse or are not fit for surgical bypass. It gives good symptomatic improvement with minimal complications.

P28

Outcomes of Radical Gastrectomy from a Prospective Database

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Introduction: Various regimens of peri or postoperative adjuvant therapy have been shown to be effective for advanced gastric cancer. However, the choice of adjuvant therapy remains controversial in the management of gastric cancer. The study's aim is to evaluate the outcomes of patients who underwent curative gastrectomy with or without adjuvant therapy and study recurrence patterns.

Methods: All patients who underwent radical gastrectomy with curative intent were selected from a prospective gastric cancer database at the National University Hospital from 2000 to 2010. Decision on adjuvant therapy was made at multidisciplinary tumour meetings.

Results: Forty-three percent (274/645) patients with gastric cancer underwent radical surgery with curative intent; 195 (71%) and 79 (29%) underwent extended lymphadenectomy (D2 or D1+) or limited lymphadenectomy (D1) respectively. The overall median survival and recurrence free survival are 25

and 21 months respectively. Adjusting for stage, surgical approach (ie. open versus laparoscopic), postoperative complications, the patients with postoperative chemo-radiotherapy had better overall survival as compared with surgery alone (HR = 0.46, 95% CI 0.27 to 0.78, $P = 0.004$); 83 patients had recurrences of which 46.9% were loco-regional, 31.3% peritoneal and 45.7% distant. Adjusting for stage, postoperative chemo-radiotherapy may have lower risk of loco-regional recurrence as compared to surgery alone (HR = 0.57, 95% CI 0.22 to 1.43, $P = 0.229$).

Conclusions: Postoperative chemo-radiotherapy had better overall survival as compared with surgery alone. More studies should be carried out to determine if postoperative chemo-radiotherapy reduces the risk of loco-regional recurrence.

P29

A Rare Case of Solid Pseudopapillary Tumour of the Pancreas in a 51-Year-Old Man

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Solid pseudopapillary tumours (SPT) of the pancreas are rare neoplasms which typically affect young females. Of unclear pathogenesis, these tumours are slow growing and have low malignant potential. We report an extremely rare occurrence of aggressive SPT of the pancreas in a 51-year-old man who presented with ureteric colic and was incidentally discovered to have a pancreatic mass on X-ray kidneys-ureters-bladder (KUB). Initial contrast-enhanced multidetector CT confirmed a pancreatic neoplasm with no radiological features of invasion. Subsequent EUS-guided fine-needle aspiration cytology was non-conclusive. Intraoperatively, a large tumour was found at the body of the pancreas with invasion of D3 and D4 of the duodenum. Unanticipated aggressive tumour growth from the time of his initial presentation to his operation was noted. Regional and peritoneal lymph nodes had no signs of metastasis. Distal pancreatectomy, splenectomy, omentectomy with en-bloc resection of D3 and D4 and duodeno-jejunostomy were performed. Postoperative histology revealed the lesion to be SPT of the pancreas with distinctive pseudopapillary structures and central hypocellularity coupled with characteristic

immunohistochemical findings. The tumour was positive for vimentin, β -catenin, CD56, CD10 and α -1-antitrypsin. The patient had an uneventful postoperative course, did not require adjuvant therapy and is presently well on regular follow-up.

P30

The Introduction and Implementation of a Wound Infection Protocol Reduces Wound Infection Rates

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Introduction: We hypothesised that the implementation of a multimodal wound infection protocol will reduce wound infections after colorectal resections.

Methods: All colorectal resections by the colorectal service from October 2010 to April 2012 were studied. Outcome measure was wound infection defined as purulent collection requiring drainage. Cumulative sum score methodology (CUSUM) was used to track the success and failure of consecutive cases. Factors used for adjustment in the CUSUM were high BMI, laparoscopic surgery and emergency surgery.

Results: Eighty-six consecutive patients were studied. The protocol was implemented after 22 patients in this series (74.4% (n=64)). Prior to the implementation, wound infection rate was 44% (16/36). This was reduced to 28% (18/64) after implementation. Of the patients after implementation, the wound infection rate was 22% (11/50) when there was complete compliance to the protocol compared to an infection rate of 50% (7/14) when there was non-compliance ($P = 0.039$). CUSUM graph showed a trend towards lower infection rates after the implementation but this trend was affected by the episodes of non-compliance.

Conclusions: Our wound infection protocol was effective to reduce wound infection rates but compliance to the protocol needs to be ensured.

P31

Delayed Isolated Splenic Metastases from an Ovarian Cancer: A Case Report and Review of the Literature

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We present a case of an isolated splenic metastasis occurring 20 years after the initial presentation. Our patient is a 45-year-old single Chinese lady who was diagnosed with right ovarian cancer at the age of 15. She had presented with epigastric discomfort and a large lower abdominal mass. She underwent a total hysterectomy, bilateral salpingo-oophorectomy and partial omentectomy. Intraoperative findings were that of 10.7 litres of serous ascites, with the right ovary being replaced by malignant tumour. There was a small patch of malignant looking tissue at the pouch of Douglas. Histology showed Granulosa cell tumour in the right ovary as well as in the tissue sample. The patient subsequently received Endoxan (cyclophosphamide), and remained disease free from 1986 onwards. Her splenic lesion this year was an incidental find on an MRI abdomen. She underwent a laparoscopic splenectomy. The spleen was enlarged (12 cm x 10.5 cm x 5 cm) with multiple cystic-looking lesions. There was no ascites or peritoneal nodules, other organs were all disease-free. The histology was Granulosa cell tumour, consistent with the previous primary.

Metastatic carcinoma to the spleen is very rare. This may be because the spleen does not have a well developed lymphoid system. In addition, the acute angle of the splenic artery branching from the celiac artery makes it difficult for large clumps of tumour cells to pass through, and the periodic contraction of the spleen may squeeze the tumour cells out into the splenic veins where they are readily phagocytosed by macrophages and tissue histiocytes. Splenectomy, combined with oophorectomy and an appropriate chemotherapy regimen can be part of a therapeutic procedure for isolated splenic metastasis. Laparoscopic splenectomy is preferred over open as it offers a shortened in-patient stay, quicker recovery time, and allows patients to be started on a chemotherapy regimen sooner.

P32

A Video Presentation on Technique of Laparoscopic Resection of Non-Adrenal Retroperitoneal Tumours

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Introduction: The laparoscopic resections of retroperitoneal tumours are technically challenging and difficult due to deep, posterior and narrow location as well as their proximity to major vessels.

Methods: We present a video of 2 cases of non-adrenal retroperitoneal tumours which were resected laparoscopically in Tan Tock Seng Hospital, Singapore.

Results: The clear magnified view of laparoscopy and energy devices enable the precise dissection of the tumours which are located in the deep narrow posterior spaces without injuring the adjacent major vessels.

Conclusions: The laparoscopic resections of retroperitoneal non-adrenal tumours are technically challenging but safe and feasible.

P33

Video Presentation of Laparoscopic Splenectomy for Massive Splenomegaly

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Introduction: We aim to demonstrate the feasibility and surgical technique of laparoscopic splenectomy for massive splenomegaly, via video demonstration of a single case.

Methods: A 64-year-old Chinese female with a history of fever, weight loss, splenomegaly and anaemia was referred for splenectomy. A preoperative CT scan of the abdomen and pelvis revealed massive splenomegaly of 20 cm x 14 cm and gallstones. Decision was made for laparoscopic splenectomy and cholecystectomy.

Results: Laparoscopic cholecystectomy and splenectomy were successfully performed. A total of 5 operating ports were utilised; 5 mm ports were placed in the epigastrium and right mid-clavicular line, a 3 mm port in the right anterior axillary line, a

10 mm port in the infraumbilical region and a 12 mm port in the left flank. Retraction of a large hepatic left lobe was necessary to expose the gallbladder. Cholecystectomy was performed first and was uneventful. Splenectomy followed, using Ligasure for tissue dissection, and EndoGIA to transect the splenic pedicle. The gallbladder was placed in a small pouch first. The spleen was then placed in with a larger bag and removed in a piecemeal fashion after enlarging the infraumbilical incision to 20 mm. Total operative time was 2.5 hours, and estimated blood loss was 200 ml. Histology of the spleen showed large B-cell lymphoma. Inpatient stay was uneventful and patient was discharged well after 2 days.

Conclusions: Laparoscopic splenectomy for massive splenomegaly is a widely accepted procedure that can be performed safely if the required expertise and equipment are available.

P34 Laparoscopic Spleen Preserving, Splenic Vessel Preserving Distal Pancreatectomy – Video Demonstration

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Introduction: In recent years, attempts have been made in treating pancreatic pathologies via a laparoscopic approach, giving rise to various resection procedures and techniques. The increasing frequency of distal pancreatic lesions has led to surgical procedures targeted at resecting the lesion whilst sparing the healthy spleen and remaining pancreatic parenchyma. In general, distal pancreatectomy is performed en bloc along with resection of the spleen, usually via an open approach. We will show a video presentation of laparoscopic spleen preserving distal pancreatectomy.

Methods: In this video, we present a case of a serous cystadenoma of the tail of the pancreas in a 57-year-old Indian lady. There were focal areas of pancreatic intraepithelial neoplasia but there were no evidence of malignancy. The patient recovered well postoperatively without complications.

Results: Laparoscopic distal pancreatectomy raises 2 main difficulties. The first is sparing the spleen and at the same time preserving the splenic vessels and the second is the treating of the pancreatic

remnant. The preservation of splenic vessels is an obvious advantage for splenic vascularisation and also reported to reduce the risk of splenic abscess and infarction postoperatively. Furthermore, literature has also reported that splenic vessels could be spared as high as 84.4% in spleen preserving distal pancreatectomy. The management of the pancreatic stump also poses a major challenge as postoperative pancreatic fistula always remains a feared complication. The use of a linear stapler to resect the pancreas also has been shown to reduce fistula formation and associated postoperative complications.

Conclusions: With the introduction of laparoscopic spleen preserving distal pancreatectomy, there are added advantages of avoidance of large abdominal incisions, high quality vision, vessel preserving procedures, lower postoperative complications, reduced hospital length of stay and faster recover times.

P35 Post-Traumatic Stress Disorder (PTSD): Translating Lessons Learned from Battlefield to Civilian Trauma

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Introduction: We aim to:

1. Familiarise the audience with lessons learned from the US military experiences in the management of traumas and post-traumatic stress disorder (PTSD).
2. Describe the Polytrauma Clinical Triad and its clinical implications for trauma management.
3. Review the impact and prevalence of PTSD resulting from civilian traumas (eg. MVA, injuries from falls, industrial accidents and interpersonal violence and abuse).
4. Identify and describe interventions which could be applied to reduce the impact and adverse effects of trauma and PTSD.

P36

Strict Selection Criteria can Reduce the Morbidity of Emergency Laparoscopic Repair of a Perforated Peptic Ulcer

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Introduction: Perforated peptic ulcer disease is a common abdominal surgical emergency. Evolution of laparoscopic surgery has affected the operative management of perforated peptic ulcer with reports favouring laparoscopic approach. While laparoscopic surgery has been shown to be safe and feasible, the application of laparoscopic approach is restricted due to various factors. From our early experience, we would like to propose selection criteria to reduce the effect of learning curve and enhance patient safety.

Methods: All consecutive patients diagnosed with perforated peptic ulcers were identified from prospective hospital administrative electronic database using the ICD-9 and ICD-10 codes. Patient data was extracted from electronic medical records and case notes. Demographic and clinical data was evaluated with emphasis on the operative details of laparoscopic approach and short-term perioperative outcomes. Boey's score, Mannheim's peritonitis index and POSSUM scores were calculated for all patients. We employed either a 3- or a 4-port technique.

Results: Forty-five patients with a median age of 52 years (range 17 to 92 years) with perforated peptic ulcer were identified. Forty-two patients (93%) underwent omental patch repair and our overall median hospital stay was 6 days with mortality of 8.9%. Fourteen patients underwent laparoscopic repair of perforated peptic ulcer and the details of these patients is presented. Mean age was 46 years (range 22 to 87 years). Nine patients (64%) were smokers, 1 patient (7%) was on non-steroidal anti-inflammatory medicine and another 1 patient (7%) was on traditional Chinese medicine for long standing history of epigastric pain. All the patients had history of sudden onset epigastric pain of less than 24 hour duration. One patient (7%) had previous history of peptic ulcer disease. Twelve patients (86%) had a Boey's score of zero and 2 patients (14%) had score of 1. Chest X-ray showed free air under diaphragm in 9 patients (64%) and in other 5 patients, a computerised tomography scan

was done to confirm the diagnosis of perforated peptic ulcer. All patients had Mannheim's peritonitis index <21 and mean index score was 14. The predicted POSSUM morbidity and mortality were 36% and 7% respectively. There were 7 gastric and 7 duodenal ulcers each with majority of the gastric ulcers in the pre-pyloric location. Nine patients (64%) had a 4-port technique and 5 patients (36%) had 3-port technique. Mean operating time was 100 minutes (range 70 to 123 minutes). Mean operating time for 4-port technique was 102 minutes while for 3-port technique was 97 minutes ($P > 0.05$). No patient was prescribed patient controlled analgesia and all the patients were able to tolerate soft diet before fourth postoperative day. Median postoperative day 1 pain score was 2 on visual analogue scale. Average length of hospital stay was 4 days (range 3 to 6 days). There were no conversions, complications or mortality.

Conclusions: Laparoscopic repair of perforated peptic ulcer is safe and feasible. If the proposed case selection criteria are applied, at least one third of the perforated peptic ulcer patients can be operated on by laparoscopic approach without any impact on morbidity and mortality even during the learning curve.

P37

Liver Metastases from Breast Cancer – Is Resection Feasible?

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Introduction: Liver metastasis occurs in 6% to 25% of patients with metastatic breast cancer and is associated with poor survival. Improvements in surgical techniques and perioperative care, and advances in liver imaging, have made resection of liver metastasis a viable option in selected cases. We aim therefore to determine the feasibility of resection of liver metastasis from a breast primary.

Methods: Retrospective review was performed of 131 patients with liver metastasis secondary to breast cancer from 1 January 2002 to 31 December 2009. Suitability for liver resection was assessed based on current standards, including number of liver lesions, albumin levels, liver reserve, fitness for surgery and response to chemotherapy.

Results: In 88% of patients (115 of 131), disseminated disease was present, most commonly in the lungs as well. Only 16 patients had no evidence of extra-hepatic disease, but only 2 were deemed suitable for liver resection. One was a 30-year-old lady with 3 lesions in a single segment which had remained stable after primary chemotherapy. She underwent mastectomy and axillary clearance and liver resection at the same setting. The other was a 70-year-old lady, with 3 lesions in 2 adjacent segments; she was however, not keen for surgery. Of the other 14 patients, 9 had diffuse liver metastasis which did not respond to chemotherapy and 5 had poor liver reserves.

Conclusions: Liver metastasis from a breast primary is often irresectable because of concomitant extra-hepatic disease or diffuse liver involvement. Systemic therapy remains the mainstay of treatment.

P38

Adult Pyogenic Liver Abscess in Singapore

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Introduction: Adult pyogenic liver abscess (PLA) is a major hepato-biliary infection with reported mortality rates of 2% to 46%. Worldwide incidence ranges from 3.6/100,000 population in America to 14.9/100,000 population in Taiwan. We aim to look at the characteristics of PLA at a single institution in Singapore and compare with data published earlier in 2000.

Methods: A retrospective study of PLA patients presenting between 2001 and 2011 to Tan Tock Seng Hospital (Singapore), a tertiary hospital of 1400 beds was performed. Demographic, clinical, biochemical, radiological and microbiological data were analysed while management and outcomes were described. Comparison with earlier data (1994 to 1997) was made and statistically significant trends are reported.

Results: A total of 741 patients were diagnosed with PLA between 2001 to 2011. Incidence was 67.5/year (from 18/year in 1994 to 1997) and 86.4/100,000 admissions. Average age was 61 years (from 58 in 1994 to 1997) while 60.6% were males. Thirty-six percent of patients had type 2 diabetes mellitus (from 21% in 1994 to 1997) while a significant proportion presented with anaemia (46%, from 19%),

acute renal failure (42%, from 3%) and poor nutrition (79%, from 5%). Sixty-six percent of patients had a solitary abscess (from 86%) while 34% had multiple abscesses (from 16%). The most common bacteria found in blood and fluid culture was *Klebsiella pneumoniae* (68% and 76% respectively, from 21% and 44% respectively). The most common aetiology was that of gallstone disease (62%) while malignancy constituted 7% (from 0%). Forty-nine percent of patients underwent percutaneous drainage (from 32%) while 6% required surgical intervention (from 7%). The average intravenous antibiotic length was 15.4 days while the average home antibiotic regime was 26.3 days; 6.8% of patients required outpatient intravenous antibiotics therapy. Mortality rate was 13% (from 0% in 1994 to 1997).

Conclusions: There is a high incidence of PLA in Singapore as compared to worldwide figures and further comparison with earlier data revealed an increasing incidence. Comparison also showed that the patient profile is increasingly more elderly with more comorbidities. During presentation, they are more likely to be in poor physiological state with anaemia, acute renal failure and poor nutrition. Similar to data around Asia, the most common causative organism is *Klebsiella pneumoniae*. Mortality is significant at 13%.

P39

Influence of Resection Margin Widths on Outcomes of Hepatic Resections for Colorectal Liver Metastases

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Introduction: Hepatic resection is the most effective therapy for patients with colorectal liver metastases (CLM) with 5 year survival of up to 58%. Traditionally, clear margins of at least 1 cm were considered a prerequisite for better survival. However, recent studies have questioned the prognostic importance of the '1 cm rule'. This study's aim is to evaluate the effect of the resection margin width on patients' outcomes.

Methods: From 2001 to 2011, all patients who underwent liver resection for CLM were selected from the Singapore General Hospital. Patients with

extra-hepatic metastases prior to resection of CLM were excluded.

Results: Overall median survival, recurrence free survival (ie. intra and extra-hepatic recurrence) and intra-hepatic recurrence free survival were 25, 10 and 14 months respectively; 165 (85.1%) and 36 (17.9%) underwent R0 and R1/2 resection respectively. Kaplan-Meier (KM) univariate survival analysis suggests patients with R0 resection had better survival as compared to R1/2 resection (HR = 0.635, 95% CI = 0.39 to 1.04, $P = 0.067$).

Among the R0 resections, 48 (29.1%), 48 (29.1%) and 69 (41.8%) had margin width of ≤ 1 , 1 to 5 and >5 mm respectively. On univariate analysis, multiple liver metastases, bilobar distribution and ≥ 3 segments resected were associated with narrower margin width. Multivariate analysis showed ≥ 3 segments resected was independently associated with ≤ 1 as compared to >5 mm resection margin (OR = 2.85, 95% CI = 1.26 to 6.43, $P = 0.012$).

Wider margins of >5 as compared to ≤ 1 mm were associated with better intra-hepatic recurrence free survival (HR = 0.544, 95% CI = 0.32 to 0.93, $P = 0.027$). However, margin width effect on overall survival and recurrence free survival was not statistically significant with P values of 0.298 and 0.484 respectively.

Conclusions: Wider resection margins are associated with lower intra-hepatic recurrence. However, it has no influence on overall survival and recurrence free survival. Achieving a 1.0 cm margin is not necessary when resecting CLMs.

P40

Case Reports: Salvage Surgery of ERCP Guidewire and Impacted Basket

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Introduction: Endoscopic retrograde cholangiopancreatography (ERCP) has been commonly used in the management of choledocholithiasis. Endoscopic extraction of bile duct stones are, however, sometimes complicated by impaction of therapeutic devices, such as stone retrieval basket with captured stones. We report 2 cases of biliary impaction which underwent successful surgical salvage. We also look into other reported methods of salvage of impacted basket. We would like to

highlight this rare complication of ERCP and look into the different reported methods of salvage.

Methods: Case report retrospective retrieval of data via case notes and operation notes.

We report 2 cases: A mechanical lithotripter (BML) basket impaction at the distal common bile duct and an impacted mechanical lithotripter and external lithotripter.

Results: Two reported cases underwent successful removal of impacted biliary stent through surgical exploration. First patient underwent an urgent CBD exploration, cholecystectomy with duodenal repair. The basket and stone were removed via cystic duct (15 mm). A T-tube was inserted. Second patient underwent an open CBD exploration; wire and baskets were delivered through choledochotomy. T-tube was inserted into CBD.

Conclusions: Endoscopic basket impactions are rare and uncommonly seen complication. Reported management strategies of impacted biliary stones include endoscopic or surgical procedures. Non-surgical options include endoscopic lithotripsy and extracorporeal shock waves. We have demonstrated successful surgical management in impacted basket when endoscopic approach fails.

P41

The Association between Central Venous Pressure and Blood Loss during Liver Resection in Relation to Intraoperative Blood Transfusion

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Introduction: This study aims to evaluate the association of central venous pressure (CVP) with intraoperative blood loss and blood transfusion during liver resection. We postulate that during liver resection, the CVP is kept at a fairly high level and the impact of this is increased intraoperative blood loss that consequently results in increased blood transfusion.

Methods: We performed a retrospective review of the 50 liver resection operations performed over a period of 1 year (2011). Electronic patient records, case notes and intraoperative anaesthetic records were thoroughly examined. Parameters examined include estimated blood loss, intraoperative CVP

and, in those patients who received blood transfusion, the volume given as well as pre and postoperative haemoglobin (Hb) levels.

Results: For the 50 patients analysed, the median CVP was 8 (4 to 14) mmHg. In the subgroup of patients with a CVP range of between 8.5 to 14 mmHg, the estimated blood loss was more than 1500 ml. A total number of 16 cases were transfused intraoperatively. In 10 of them, postoperative Hb was higher than the preoperative Hb, averaging around 62.5% of over-transfusion.

Conclusions: There is an association between lower intraoperative CVP and less estimated blood loss with a reduction in the need for intraoperative blood transfusion. In several cases, the postoperative Hb levels are noted to be higher than preoperative Hb levels. This may reflect an element of over transfusion or over estimation of the intraoperative blood loss.

P42

Gallbladder Perforations Successfully Managed Without Emergency Cholecystectomy

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Introduction: We aim to review the types of gallbladder perforations that can be managed without emergency cholecystectomy and how to manage them.

Methods: Fourteen consecutive patients were diagnosed with gallbladder perforation on radiological imaging or intraoperative findings from July 2010 to December 2011 in a single institution. Mean follow-up was 3.5 months. Patient demographics, clinical presentation, radiological findings, operative data, length of hospital stay, morbidity and mortality rates were analysed retrospectively. Gallbladder perforations were divided into 3 types using Neimeier's classification system.

Results: Eleven males and 3 females with a mean age of 67 years had gallbladder perforation. One patient was excluded from analysis as his gallbladder perforated due to carcinoma. Average length of stay was 15 days and the most common

presenting symptoms were abdominal pain and fever. A majority of patients had elevated white cell counts (92%) and deranged liver function tests (69%). Nine patients required emergency cholecystectomy with a postoperative morbidity rate of 11% and no mortality. Four remaining patients were managed without emergency cholecystectomy: all received intravenous antibiotics; 2 patients underwent elective cholecystectomy at a later date, 1 patient had a percutaneous cholecystostomy tube insertion, and 1 patient underwent ERCP for a common bile duct stone retrieval. These 4 patients had type 2 perforations with no morbidity or mortality from conservative treatment.

Conclusions: Early diagnosis, recognition and emergency surgical intervention are of crucial importance in the treatment of perforations of gallbladder. There may, however, be a select group of patients who can be treated successfully without emergency cholecystectomy.

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