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# Welcome Message from the Congress Chairman

#### Dear Colleagues,

I would like to personally welcome each of you to the APMBSS2014, in Ao Nang Villa, Krabi, Thailand. Bariatric and Metabolic Surgery is a rapidly growing and exciting area in which to work, study, and further develop. It is an exciting time to bring inspired, talented people together to exchange and contribute to this unique filed of surgery. I am sure that we, together, can keep the Asia Pacific Metabolic and Bariatric Surgery Society at the cutting edge.

The main topic of this conference will focus on "Metabolic and Bariatric Surgery: Focus on Failure and Redo". Starting from Definition and cause of Failure, Concept of Revision surgery, surgical Technique, etc. with the cooperation of our friends from all area the regional; I can assure you a very informative, interactive conference which will keep us on edge.

Krabi is a very nature-oriented, amazing out-door paradise, where everyone can enjoy apart from our intensive conference. You will find that we are combined our programs and activities so that you will not missed the opportunities to explore our beautiful nature.

I would like to that this opportunity to thank our friends in the APBSS, and invite each and everyone of you to attend the APMBSS2014 in Krbi, Thailand. And hope to personally see you in Krabi on 24-26 April 2014.

Dr. Paisal Pongchairerks

Painl Popelits

**Congress Chairman** 

Thai Society of Metabolic and Bariatric surgery



#### **Organizing Committee**

**Congress Chairman** 

**Vice Chairman** 

**Secretary General** 

**Chairman of Scientific** 

Committee

**Treasurer & Exhibition** 

**Congress Venue & Social** 

**Public Relations** 

Secretariat

**Committee** 

Dr. Paisal Pongchairerks

Dr. Thanyadej Nimmanwudipong

Dr. Sutdhachit Linananda

Dr. Suthep Udomsawaengsup

Dr. Panot Yimcharoen

Dr. Apichai Chaiyaroj

Dr. Poochong Timratana

Dr. Ajjana Techagumpuch

Dr. Chingyiam Panjapiyakul

Dr. Theerapol Ankoolpakdeekul

Dr. Prinya Akranurakkul

Dr. Preeda Sumritpradit

Dr. Pitichote Hiranyatheb

Dr. Amarit Tansawet

Dr. Suriya Punchai

Dr. Komdej Thanavachirasin

Dr. Kanokkan Tepmalai

Dr. Kamthorn Yolsuriyanwong

Dr. Taweechai Visanuyothin

Dr. Voraboot Taweerutchana

Dr. Angkoon Anuwong

Dr. Suchayes Pumchandh

Dr. Kamthorn Yolsuriyanwong

Dr. Siripong Chewatanakornkul

Dr. Kriengsak Chainapapong

Dr. Maha T. Dheve

# Asia Pacific Metabolic and Bariatric Surgery Society Council

**President Elect** 

**President** 

**Treasurer** 

**Past President** 

Dr. Davide Lomanto

Dr. Wei-Jei Lee

Dr. Jimmy Bok-Yan So

Dr. Pradeep Chowbey





#### Dr. Praveen Palanivelu Raj

Completed his Bachelors of Medicine in PSG Institute of Medical Sciences, Coimbatore with honours and the Masters in General Surgery from the prestigious Sri Ramachandra University, Chennai. He also secured his masters in Surgery from the National Board (DNB). He completed his fellowship in Bariatric surgery from Tugun, Australia and the Weill-Cornell University at NYC. He's also been honoured with the Honorary Fellow in Advanced laparoscopy by the Indian Association for Gastrointestinal Endosurgeons (IAGES)

Dr. Tik Fu Gee

Dr. Philip Raymond Schauer

Dr. Mathias Fobi

Well known internationally for developing and pioneering the banded gastric bypass procedure. He has performed over 12,000 bariatric operations and has served as the Medical Director of the Center for Surgical Treatment of Obesity at three Medical Centers of Excellence. Dr. Fobi currently holds the position of Chairman of the Board of Trustees of the International Federation for Surgery of Obesity (IFSO), and has previously served as President of IFSO, President of the California Chapter of the ASMBS and President of the ASMBS Foundation. He has over 50 publications and lectures worldwide on metabolic and bariatric surgery.

Dr. Lum Fobi

Dr. Camilo Boza

Dr. Stanley James Rogers

Dr. Muffazal Lakdawala

Founder, Centre for Obesity and Diabetes Surgery and the First Indian Center for Excellence (ICE) for Bariatric Surgery

#### Dr. Huang Chih-Kun

Founding Chairman, International Excellence Federation (I.E.F) for Bariatric & Metabolic Surgery Director, Bariatric & Metabolic International (B.M.I) Surgery Center, E-Da hospital, Taiwan Director, International Minimally Invasive Surgery Training Center, E-Da hospital, Taiwan President, Taiwan Obesity Support Association (T.O.S.A)

Visiting Professor, Guangzhou Medical University, China and GEM Hospital, India

#### Dr. Jaideepraj Rao

Senior Consultant and Head of the Upper Gastrointestinal & Minimal Access Surgery unit and the Director of the Bariatric Surgery Programme in the Department of Surgery in Tan Tock Seng Hospital, Singapore. He is also a clinical Teacher at the Yong Loo Lin School of Medicine, National University of Singapore.





Executive Vice Chairman – Max Healthcare Institute Ltd. and Director – Max Institute of Minimal Access, Metabolic and Bariatric Surgery (MAMBS) at Max Super Speciality Hospital, New Delhi (India). He belongs to the cadre of pioneer laparoscopic surgeons of Indian subcontinent and the world. He was one of the first to perform Laparoscopic cholecystectomy in India and has worked with singular determination to develop, evaluate and propagate Minimal Access, Metabolic & Bariatric (obesity) Surgery in India.

#### Dr. Wei Jei Lee

Vice Superintendent of Min-Sheng General Hospital Taoyuan, Taiwan. Professor of Surgery, National Taiwan University and Chun-Kong University. President, Taiwan Society for Metabolic and Bariatric Surgery. President, IFSO- Asia Pacific Chapter

Dr. Mahadevan Deva Tata

Dr. Davide Lomanto

Dr. Ike Mendosa

Dr. Shashank S. Shah

Dr. Mohit Bhandari

Dr. Ken Loi

Dr. Jimmy So Bok Yan

Associate Professor of Surgery, Yong Loo Lin School of Medicine, National University of Singapore. Director and Senior Consultant, Upper GI Surgery Service and Centre for Obesity Management and Surgery, University Surgical Cluster. Head, Upper GI Tumour Group, National University Cancer Institute Singapore

Dr. Aparna Govil Bhasker

Dr. Manish Baijal

Senior Consultant Organisation Max Healthcare, Department Institute of Minimal Access, Metabolic & Bariatric Surgery, New Delhi

#### Dr. Jayashree Todkar

Director of Dept of Bariatric surgery, Ruby Hall Clinic Pune, Poona Hospital, and Dr L H Hiranandani Hospital, Mumbai. First female Bariatric surgeon from India. Medical education for graduation and post graduation from B J Medical College, Pune. Diploma in Laparoscopic surgery from University of Strassbourg, France. Fellowship in Bariatric and Metabolic surgery from Cleveland Clinic, USA and Brazil.

Dr. Oraluxna Rodanant

Dr. Kazunori Kasama

Director of Weight Loss and Metabolic Surgery Center, Yotsuya Medical Cube

Dr. Yosuke Seki

Dr. Anton Cheng

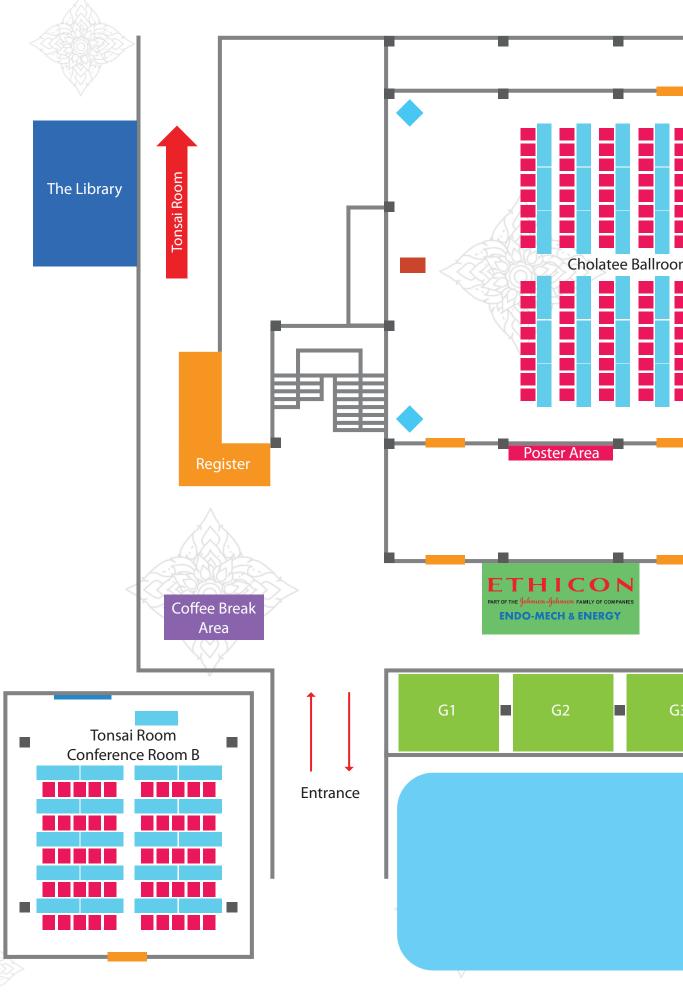
Senior Consultant Department of Surgery, Khoo Teck Puat Hospital, Singapore

Dr. Allen Alfred Buenafe

Dr. Miguel Mendoza

A/Professor of Surgery, Department of Surgery of UERM Memorial Medical Center 1997 to present. Specialty: Minimally Invasive Surgery/Metabolic & Bariatric Surgery. International Honorary Professor, GEM Obesity and Diabetes Surgery Center, Combaitore, India

# Floor Plan





# ETHICON

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# PROGRAM AT A GLAN

# Thursday 24 April 2014

78	9		10.00-		
Room	08.30-10.00		08.30-10.00 10.30-12.00		
Chonlatee Ballroom	Registration	Opening Ceremony  Distinguished Lecture  "Metabolic Surgery: Updated evidence-based" Dr. Philip Raymond Schauer	Coffee Break	Failure; What and why? Chairman Dr. Suthep Udomsawaengsup Dr. Pradeep Chowbey, Dr. Mathias Fobi Dr. Davide Lomanto Dr. Seigo Kitano  Necesstity of re-operation: Evidence-Based Dr. Chin-Kun Huang  Complexity of re-operation: Dr. Philip Raymond Schauer  Failure to loss weight: What and Why Dr. Camilo Boza  Weight Regain Dr. Asim Shabbir  Revision due to complication Dr. Muffazal LakdawalaDISCUSSION	
Tonsai Room					







.00- .00	13.00-14.30	14.30- 1500	15.00-18.30	18.30-22.00

#### **Failure of Restrictive** procedure

--Chairman--

Dr. Apichai Chaiyaroj, Dr. Chin-Kun Huang Dr. Wilfred Mui, Dr. Kazunori Kasama

Revisional surgery after restrictive procedures - current evidence based : Dr. Praveen Palanivelu Raj

#### I. Fail Band Options:

to Reband (Histological changes to stormach after Band removal - implication on re-operation):

Dr. Ken Loi

to Sleeve: Dr. Jimmy So Bok Yan to Bypass: Dr. Shashank S. Shah

to BPD: What to do and not to do: Dr. Anton Cheng

#### **II. Fail LSG Options:**

any role of re-sleeve: Dr. Ike Mendosa to Bypass/SADi: Dr. Muffazal Lakdawala add DJB: Dr. Yosuke Seki add Banded: Dr. Mohit Bhandari to BPD/DS: Dr. Jaideepraj Rao

----DISCUSSION-----

#### **Complication section**

----Chairman-----

Dr. Preeda Sumritpradit, Dr. Wei Jei Lee Dr. Stanley James Rogers, Dr. Hui Liang

Management of leakage in **Bariatric Surgery:** Dr. Davide Lomanto

vit B I 2 concerns In Asian Indians **after Bariatric Surgery :** Dr. Jayashree Todkar

**Total gastrectomy for Chronic** leakage from LSG: Dr. Camilo Boza

Sea Sand Sun of Krabi Sea **Confirm Your Participation** at APMBSS Tour Desk

**Committee** Meeting "at The Library"

**Evening Symposium Fair** 





# Friday 25 April 2014

Room	08.00- 08.30	08.30-10.00	10.00- 10.30	10.30-12.00	
Chonlatee Ballroom	MSD Morning Symposium	Special Lecture: Bariatric implication from the living legend: Dr. Mathias Fobi  Failure of Malabsorptive ProcedureChairman Dr. Sutdhachit Linananda Dr. Asim Shabbir Dr. Aparana Govil Bhasker Dr. Jayashree Todkar  I. Redo bypass: Reversal of RY: How and Why: re-pouch size: Dr. Manish Baijal Elongate limb: Dr. Stanley James Rogers Bypass to LSG: Dr. Muffazal Lakdawala  II. Fail MGB options: Dr. Wei Jei LeeDISCUSSION	Coffee Break	Prevention of FailureChairman Dr. Paisal Pongchairerks, Dr. Anton Cheng, Dr. Simon Wong, Dr. Ike Mendosa  Redo Surgery - When and What? (ow to prevent) Dr. Pradeep Chowbey  Compare banded and non banded: Dr. Mathias Fobi  Banded plication: Dr. Chin-Kun Huang  Prevention of GRED after sleeve gastrectomy: Crual repair for whom?: Dr. Kazunori Kasama  Learning curve in LRYGB: Dr. Jaideepraj Rao	
Tonsai Room		Free Paper 1Chairman Dr. Poochong Timratana, Dr. Jaideepraj Rao	Coff	Surgical technique of redo-operation (VDO section) Chairman Dr. Panot Yimcharoen, Dr. Nik Rirza Kosai, Dr. Simon Wong  Reversal of RYGB: Dr. Manish Baijal Laparoscopic conversion of Roux-en-y gastric bypass to sleeve gastrectomy: Dr. Aparna Govil Bhasker few difficult cases on revisional sugery with video: Dr. Ken Loi  Single Incision revisional sleeve to bypass - video: Dr. Praveen Palanivelu Raj Lap revision of stricture after leakage post - sleeve gastrectomy: Dr. Shashank S. Shah Heller myotomy after LSG in patient with previous Hepaticojejunostomy: Dr. Asim Shabbir Laparoscopic correction of a gastrocolic fistula following a leak after sleeve gastrectomy: Dr. Aparna Govil Bhasker	

12.0 13.

0- )0	13.00-14.30	14.30- 1500	15.00-18.30	18.30-22.00	
	Metabolic surgeryChairman Dr. Thanyadej Nimmanwudipong, Dr. Jimmy So Bok Yan, Dr. Camilo Boza, Dr. Shashank S. Shah  LSG + DJB for metabolic sugery: update and result: Dr. Kazunori Kasama  Metabolic surgery in low BMI: Dr. Hui Liang  Sleeve gastrectomy and dyslipidemia: Dr. Jayashree TodkarDISCUSSION	Coffee Break	Krabi City Tour Confirm Your Participation at APMBSS Tour Desk	Congress Dinner	
	Free Paper 2Chairman Dr. Mahadevan Deva Tata, Dr. KaNokkan Tepmalai Dr. Tik Fu Gee	Co		Cong	

# Saturday 26 April 2014

Room	09.00-11.30	11.30-13.00
Chonlatee Ballroom	Innovation!Chairman Dr. Poochong Timratana, Dr. Panot Yimcharoen Intragastric Balloon: Dr. Wilfred Mui Endoscopic Revision of Gastrojejunostomy after Gastric Bypass: Dr. Simon Wong	
	Panel Discussion Challenge Cases	Closing session  Cocktail Lunch
Tonsai Room	Free Paper 3Chairman Dr. Allen Alfred Buenafe, Dr. Suriya Punchai, Dr. Praveen Palanivelu Raj	COCKTOIL EURICII





# SCIENTIFIC PROGRAMME

24 - 26 April 2014 Aonang Villa Hotel Krabi Thailand









# Thursday 24 April 2014 Section: Distinguished Lecture

Time: 08.30-10.00 Chonlatee Room

**09.00-10.00** "Metabolic Surgery: Updated evidence-based"

Dr. Philip Raymond Schauer









# Thursday 24 April 2014 Section: Failure; What and Why?

Time: 10.30-12.00 Chonlatee Room

**Chairman:** Dr. Suthep Udomsawaengsup

Dr. Pradeep Chowbey

Dr. Mathias Fobi

Dr. Davide Lomanto

Dr.Seigo Kitano

Necesstity of re-operation: Evidence-Based

Dr. Chin-Kun Huang

Complexity of re-operation

Or Philip Paymond Schaue

Dr. Philip Raymond Schauer

Failure to loss weight: What and Why

Dr. Camilo Boza

Weight Regain

Dr. Asim Shabbir

Revision due to complication **Dr. Muffazal Lakdawala** 

**Discussion** 



#### Thursday 24 April 2014

**Section: Failure of Restrictive Procedure** 

Time: 13.00-15.00 Chonlatee Room

Chairman: Dr. Apichai Chaiyaroj

Dr. Chin-Kun Huang

Dr. Wilfred Mui

Dr. Kazunori Kasama

Revisional surgery after restrictive procedures - current evidence based

Dr. Praveen Palanivelu Raj

#### I. Fail Band Options

To Reband (Histological changes to stormach after Band removal - implication on re-operation)

Dr. Ken Loi

To Sleeve

Dr. Jimmy So Bok Yan

To Bypass

Dr. Shashank S. Shah

To BPD: What to do and not to do

Dr. Anton Cheng

#### II. Fail LSG Options

Any role of re-sleeve

Dr. Ike Mendosa

To Bypass/SADi

Dr. Muffazal Lakdawala

Add DJB

Dr. Yosuke Seki

Add Banded

Dr. Mohit Bhandari

To BPD/DS

Dr. Jaideepraj Rao

**Discussion** 





# Thursday 24 April 2014 Section: Complication Section

Time: 13.00-14.30 Tonsai Room

Chairman: Dr. Preeda Sumritpradit

Dr. Wei Jei Lee

Dr. Stanley James Rogers

Dr. Hui Liang

Management of leakage in Bariatric Surgery

Dr. Davide Lomanto

Vit B I 2 concerns In Asian Indians after Bariatric Surgery

Dr. Jayashree Todkar

Total gastrectomy for Chronic leakage from LSGDr.

Dr. Camilo Boza







# Friday 25 April 2014 Section: Failure of Malabsorptive Procedure

Time: 8.30-10.00 Chonlatee Room

Chairman: Dr. Sutdhachit Linananda

Dr. Asim Shabbir

Dr. Aparana Govil Bhasker

Dr. Jayashree Todkar

Special Lecture: Bariatric implication from the living legend

Dr. Mathias Fobi

#### I. Redo bypass

Reversal of RY: How and Why: re-pouch size

Dr. Manish Baijal

Elongate limb

Dr. Stanley James Rogers

Bypass to LSG

Dr. Muffazal Lakdawala

II. Fail MGB options

II. Fail MGB options

Dr. Wei Jei Lee

**Discussion** 





#### Friday 25 April 2014

**Section : Free Paper 1-8** 

Time: 8.30-10.00

#### **Tonsai Room**

Chairman: Dr. Poochong Timratana
Dr. Jaideepraj Rao

1. Causes and Outcomes of Revisional Bariatric Surgery:
Initial Experience at a Single Center
Ji Yeon Park, MD
Dan Song, MD, PhD
Yong Jin Kim, MD, PhD

**08.41-08.51** 2. Revision Bariatric Surgery in Singapore *Anton Cheng, MD* 

08.52-09.02
3. Current Status of Metabolic and Bariatric Surgery in Korea

Choi, Seung Ho1

Ahn, Soo Min2

Lee, Sang Kuon3

4. Experience of Revision Sugery for Laparoscopic Roux-en-Y Gastric Bypasss
 Jung-Chien Chen MD
 Wei-Jei Lee MD, PhD
 Kong-Han Ser MD

09.14-09.24
5. Roxy-en-Y Gastric Bypass for Lower Esophageal Submucosal Cancer in an Obese Diabetic Patient Dr. Almulaifi Abdullah M.
Prof. Lee Wei-Jei

09.25-09.35
6. Nove Anti Reflux Bariatric Surgery: Laparoscopic Revision of Gastric Band to Nissen Fundoplication and Sleeve Gastrectomy for Gerd

Eng-Hong Pok1
Wei-Jei Lee2

7. Enterotomy Closure Using Knotless and Barbed Sutures in Laparoscopic Upper Gastrointestinal and Bariatric Surgeries

\*\*Bautista Mary Therese1\*\*
Rao Jaideepraj2\*\*
Khin Thida Soe5\*\*
Kono Koji1, 3\*\*
Chen Litang1\*\*
Shabbir Asim1, 3\*\*

09.47-09.57
8. Near Complete Gastric Necrosis Due to Gastric Prolapse
After Gastric Banding
Sang Kuon Lee, MD
Jae Woo Park, MD



### 1. Causes and Outcomes of Revisional Bariatric Surgery: Initial Experience at a Single Center

Ji Yeon Park, MD. Dan Song, MD., PhD. Yong Jin Kim, MD., PhD.

Department of Surgery, Soonchunhyang University Hospital, College of Medicine, Seoul, Republic of Korea

**Background:** Bariatric surgery has become more prevalent owing to the worldwide obesity epidemic. With the growing number of bariatric procedures performed annually, the requirement for revisional and secondary operations is increasing accordingly. This study aimed to evaluate the initial experience of revisional bariatric surgery at a single specialized center.

**Methods:** A retrospective review of the prospectively established database identified all patients who underwent revisional bariatric surgery between January 2008 and August 2013. The causes, surgical outcomes, and efficacy of the revisional surgeries were analyzed.

**Results:** Twenty-three revisional surgeries were performed laparoscopically during the study period (laparoscopic adjustable gastric banding, n=14; laparoscopic sleeve gastrectomy, n=9). The most common indication for revision was weight regain or insufficient weight loss (12/23, 52.2%), and Roux-en-Y gastric bypass (RYGB) was the most commonly performed secondary procedure (17/23, 73.9%, including four resectional RYGB procedures).

Gastric pouch leak occurred in one patient following revisional RYGB, which required reoperation on the first postoperative day. The mean body mass index decreased from 36.1 to 28.8 kg/m2 at a mean follow-up period of 8 months after revision. The percent excess weight losses at 1, 3, 6, and 12 months postoperatively were 18.8%, 41.1%, 40.1%, and 47.4%, respectively.

**Conclusion:** Revisional bariatric surgery can be successfully performed via a laparoscopic approach with acceptable risk. Deliberate selection for the proper revisional procedure can efficiently manage undesirable results from the primary surgery.







#### 2. Revision Bariatric Surgery in Singapore

Anton Cheng, MD.

KTP Hospital, Singapore

**Objective:** Introduction Bariatric surgery is being carried out in increasing in Singapore, in common with the rest of the world. With this increase, the number of revision procedures also rises in concert. Whilst international results have reported excellent outcomes up to 15 years, there is limited data from Asia. We review the clinical data of those patients who have undergone revision bariatric surgery from a single center in Singapore.

**Material and method:** A review of a prospectively collected bariatric surgery database of revision bariatric surgeries in a single institution in Singapore over a 10-year period was performed. The surgeries were classified according to the type of primary bariatric procedures and analysed by the type of revision surgeries. Techniques employed during revision surgery were described in detail

**Result and conclusion:** A total of 480 patients with a median follow up of 54 months were included for analysis. The primary procedure included: laparoscopic adjustable banding (LAGB), vertical gastric banding (VBG), sleeve gastrectomy(LSG), and Roux-en-Y gastric bypass (RYGB) or bilio-pancreatic bypass (BPD). A total of 12.9% of patients had a secondary procedure.

Indications for revision surgery included: failure of sustained weight loss, technical complications related to the LAGB and malnutrition post-BPD. revision bariatric surgery had lower complication rate (overall 11.4%) when compared to primary bariatric surgery (overall 22.3%). Revision bariatric surgery yielded more modest weight loss (3.2±13.7kg) when compared to primary surgery (8.3±13.0kg).

There was no statistical difference in the percentage excess weight loss between primary and secondary bariatric surgery in both the 1st and 2nd years after surgery (p=0.82 and p=0.36 respectively). There were 2 fatalities from the primary surgery group and one from the revision group, total of 0.6% Conclusion Revision Bariatric surgery can be carried out safely and just as effective as the primary procedure.



#### 3. Current Status of Metabolic and Bariatric Surgery in Korea

Choi, Seung Ho1 Ahn, Soo Min2 Lee, Sang Kuon3

- 1. Department of Surgery, Gangnam Severance Hospital, Yonsei University College of Medicine
- 2. Gastrointestinal Metabolic Surgery Center, Hallym University Sacred Heart Hospital
- 3. Department of Surgery, Daejon St. Mary's Hospital, The Catholic University of Korea

**Objectives:** Bariatric surgery was introduced to Korea in 2003, whereas obese population increased tenfold between 1995 and 2005. This nationwide survey directed to members of The Korean Society for Bariatric and Metabolic Surgery (KSMBS) was designed to bring light to the current status of bariatric surgery in Korea. Materials & methods: A questionnaires for the number and type of bariatric surgery were filled out by the member of KSMBS.

**Results:** Although only six surgeons were performing bariatric surgeries in 2003, the number of surgeons increased fourfold in 2009 (n=23). The number of procedures increased more than 7-fold from 2003 to 2009 (n= 125, n=778). In 2003, sleeve gastrectomy, Roux-en-Y gastric bypass, mini-gastric bypass and vertical banded gastroplasty were performed in the tertiary referral centers.

Laparoscopic gastric banding procedure was launched in 2004 and duodenoje-junal bypass procedures were applied to the patients with type 2 diabetes as a novel procedure in 2009. Vertical banded gastroplasty has been no longer a surgical option since 2007. Currently, laparoscopic adjustable gastric banding became one of the most popular bariatric procedures (68%), followed by Roux-en-Y gastric bypass, duodeno-jejunal bypass, sleeve gastrectomy, and mini-gastric bypass (16.0%, 5.5%, 5.5% and 3.0%, respectively).

Revision procedures accounted 2% among all bariatric procedures. The majority of surgeons (68%) regarded Roux-en-Y gastric bypass as an ideal procedure for treating metabolic co-morbidities followed by duodenojejunal bypass.

**Conclusion:** Currently the number of bariatric surgery has explosively increased in Korea mainly because of unique tendency; 1) a gradual increment in Roux-en-Y gastric bypass in the university hospitals and 2) an explosion of gastric banding in the private clinics. Bariatric surgery becomes a major surgery field in Korea.







# 4. Experience of Revision Sugery for Laparoscopic Roux-en-Y Gastric Bypasss

Jung-Chien Chen MD. Wei-Jei Lee MD., PhD. KOng-Han Ser MD.

Department of Surgery Min-Sheng General Hospital, National Taiwan University, Taiwan

**Background:** Laparoscopic Roux-en-Y gastric bypass (LRYGB) is one of the effectively bariatric surgeries. It is usually safe and feasible for treatment of morbid obesity. But there are patients with inadequate weight loss or weight regain after this procedure. Sometimes, LRYGB may lead malnutrition and anemia post-operatively. In serious cases, espicially with unsatisfactory results after conservative treatment, the revision sugery is necessary to maintain adequate life quality. We present our experience of revision surgery for LRYGB.

**Methods:** There are 924 consecutive patients underwent LRYGB between December 2000 and January 2014. 642 cases are female. And 258 of them were with diabetes mallitus (DM). The mean body mass index (BMI) was 38.7 Kg/m2 (23.3-62.9 Kg/m2) before LRYGB. From July 2008 to January 2014, eleven cases received revision surgery. Mean body mass index (BMI) was 29.2 Kg/m2 (18.7-37.6 Kg/m2) before revision surgery. 9 cases are feamle. None of them is with DM. We collect the data.

**Results:** The mean operative time was 184.5 minutes (90-305 minutes). The post-operative hospital stay was 11 days (3-39 days). There were four caese with major complications after revision surgeries, including leakage and massive internal bleeding. Surgical interventions were necessary. And two cases were with minor complication. They were solved by conservative treatment. There was no mortality post-operatively.

**Conclusion:** Revision surgery for LRYGB is more complex and difficult. And it is with high complication rate. But in patients with intractable conditions after LRYGB, revision surgery seem to be the only way to solve the problems. The high risks related to revision surgery should be informed the patient actually pre-operatively. And the revision surgery should be processed by experienced surgeons. The long-term result and efficacy need further follow-up and study.



### 5. Roxy-en-Y Gastric Bypass for Lower Esophageal Sumucosal Cancer in an Obese Diabetic Patient

Dr. Almulaifi Abdullah M. Prof. Lee Wei-Jei

Department of Surgery, Min-Sheng General Hospital, National Taiwan University, Taoyuan, Taiwan.

**Introduction:** Obesity is becoming an epidemic health problem and is associated with concomitant diseases. It also has been identified as an independent risk factor for the development of gastroesophageal reflux disease and Barrett's esophagus, which increases the incidence of esophageal cancer. We present a case of early esophagus cancer in obese diabetic patient treated with laparoscopic Roux-en-Y gastric bypass (LRYGB).

Case Presentation: A 52-year-old-male, non-smoker, BMI 30.6 Kg/m2, with hypertension and poorly controlled T2DM for four years. His glycated hemoglobin testing (HbA1c) is 7.6% under oral antidiabetic drugs. No history of dysphagia or abnormal pain. His endoscopy showed a noncircumferential polypoid tumor 2 cm above the esophagogastric junction suggesting early lower esophagus cancer. The biopsy confirmed moderately differentiated adenocarcinoma. Computed tomography revealed neither lymph node nor distant organ metastasis.

Endoscopic ultrasonography showed tumor involving the submucosa and no regional lymph nodes. A diagnosis of lower esophageal cancer was made (clinical stage IA, T1bN0M0).

The case was discussed at multidisciplinary oncology meeting, and decided to perform a metabolic surgery in association with tumor resection. This operation offered an opportunity to solve his oncologic disease and metabolic problem simultaneously.

We performed distal esophagectomy with retro-colic-and retro-gastric Roux-en-Y gastric bypass reconstruction with inferior mediastinal and abdominal lymph nodes dissection. Histopathological examination of the resected specimen revealed a submucosal moderately differentiated adenocarcinoma arising from Barrett's esophagus with no lymph node involvement (0/5) and both end margins more than 1 cm were free (TNM stage pT1bN0Mx).

Operation time was 240 minutes, and intraoperative estimated blood loss was about 50 ml. The postoperative course was uneventful and patient was discharged on the 10th postoperative day. At six-month follow-up his body weight reduced from 82.3 Kg to 70 Kg, BMI was from 30.6 Kg/m2 to 26. Kg/m2 and HbA1c improved from 7.6% to 6.1% without any medication.

**Conclusion:** this is the first case, to our knowledge to be reported of early esophageal cancer discovered prior to metabolic surgery and was treated laparoscopically. Despite the short follow-up, LRYGB was presumably to have maintained both good oncologic and metabolic results for this patient.



# 6. Nove Anti Reflux Bariatric Surgery: Laparoscopic Revision of Gastric Band to Nissen Fundoplication and Sleeve Gastrectomy for Gerd

Eng-Hong Pok1 Wei-Jei Lee2

- 1. Department of Surgery, University Malaya Medical Center, University of Malaya, Malaysia
- 2. Department of Surgery, Min-Sheng General Hospital, National Taiwan University, Taiwan

In this video we present the case of a 32-year old lady without co-morbidity (BMI 35kg/m2) who presented with severe gastro-oesophageal reflux (GERD) having previously undergone an laparoscopic gastric banding in 2011 (original BMI 34kg/m2) to aid weight loss. The barium swallow demonstrated impaired motility in the entire oesophagus with gastro-oesophageal reflux to the level of the mid-oesophagus.

Although Roux-en-Y gastric bypass would be an ideal revisional procedure for GERD but she considered it was too drastic procedure for weight loss with risk of long term complications. Therefore, a novel anti-reflux sleeve gastrectomy with combination of Nissen fundoplication and sleeve gastrectomy was undertaken. The patient made an uncomplicated recovery and was discharged on postoperative day 3 with ameliorated reflux symptoms. At 4 months, her BMI was 29.7 kg/m2and EWL 19.6% with completely resolved GERD.

This video will illustrates the important steps for performing this novel procedures. This innovative bariatric procedure is suitable for 1) low BMI patient with severe GERD; 2) patient with pre-existing antireflux procedure who need obesity surgery, avoiding unnecessary risk of taking down the gastric wrap.



# 7. Enterotomy Closure Using Knotless and Barbed Sutures in Laparoscopic Upper Gastrointestinal and Bariatric Surgeries

Bautista Mary Therese1 Rao Jaideepraj2 Khin Thida Soe5 Kono Koji1, 3 Chen Litang1 Shabbir Asim1, 3

- 1. National University Hospital, Singapore
- 2. Tan Tock Seng Hospital, Singapore
- 3. National University of Singapore

**Background:** Barbed sutures have recently being employed in intracorporeal suturing in various laparoscopic digestive surgeries.

**Aim of Study:** The goal of this study is to present our initial experience of enterotomy closure with barbed sutures in upper gastrointestinal and bariatric surgery and share optimal technique of using such sutures for enterotomy closure.

**Methods:** Fifty patients who underwent laparoscopic closure of enterotomies using barbed sutures were identified in two institutions in Singapore from January 2012 to December 2013. Patient demographics, short-term operative outcomes including anastomotic time, onset of diet, hospital stay, and early post-operative complications are reported.

**Results:** In 50 patients a total of 62 anastomotic sites were closed with barbed sutures. The barbed sutures appear to reduce mean anastomotic suturing time of the Rouex-en-Y gastrojejunal closure (17.34 vs 44.55mins, p value 0.0001) and jejunojejunal closure (19.46 vs 31.01mins, p value 0.0013) when compared to a subgroup of patients with the same anastomotic sites closed using the standard non-barbed suture. The mean onset to start on diet was  $2 \pm 1.5$  days and mean duration of hospital stay is 7 + 5.3 days. One (1.61%) anastomotic leak was observed day 3 after a gastric bypass in the series.

This leak was the result of a technical error due to inappropriate suturing technique. There were no mortalities, other complications or readmission. We learnt that in order to get good tissue apposition, while traction on the suture brings the two edges closer, pushing the tissues toward each other enhances more apposition and prevent unnecessary tearing of tissues that can potentially result in complications.

**Conclusion:** Barbed closure sutures appear to be safe and effective in laparoscopic upper gastrointestinal procedures for closing enterotomies provided appropriate technique is used. The potential benefit is simplifying intracorporeal enterotomy closure.





# 8. Near Complete Gastric Necrosis Due to Gastric Prolapse After Gastric Banding

Sang Kuon Lee, MD. Jae Woo Park, MD.

Department of Surgery, Daejeon St. Mary's Hospital The Catholic University of Korea

Laparoscopic Adjustable Gastric Banding is a popular procedure worldwide for the treatment of morbid obesity because this procedure is simple and relatively safe, though it has the risk of late complications, such as band erosion or gastric slippage. Although infrequent, prolapsed stomach could cause gastric necrosis, which is associated with significant morbidity. If not timely recognized, gastric necrosis could even lead to fatal outcome. Herein, we present a gastric banding patient complicated with gastric necrosis due to gastric prolapse, which was successfully treated with gastric resection.

A 28-year-old female, who suffered from morbid obesity with a pre-gastric banding BMI of 42.6 (109 kg, 159.9 cm), was admitted to our institution 18 months after laparoscopic gastric banding procedure done elsewhere. One week before admission, the patient had the gastric band removed elsewhere due to gastric prolapse causing severe abdominal pain and persistent vomiting.

Nevertheless, she continued to have sustained abdominal pain and vomiting after band removal and visited to Emergency Department at another institution. There, she was diagnosed with diffuse gastric wall necrosis and perforation and was referred to our institution. Emergency surgery was performed, where extensive devitalization and full-thickeness gastric wall necrosis due to complete obliteration of left gastric artery with several areas of perforation were observed. As the and uppermost aspect of stomach including cardia was viable, near-total gastrectomy leaving a small gastric pouch with Roux-en-Y gastrojejunostomy with 75-cm long Roux limb for weight maintenance was performed. Postoperative hospital course was uneventful and she discharged without clinically significant complication.







### Friday 25 April 2014 Section: Prevention of Failure

Time: 10.30-12.00 Chonlatee Room

**Chairman:** Dr. Paisal Pongchairerks

Dr. Anton Cheng Dr. Simon Wong Dr. Ike Mendosa

Redo Surgery - When and What? (How to prevent)

Dr. Pradeep Chowbey

Compare banded and non banded

Dr. Mathias Fobi

Banded Plication

Dr. Chin-Kun Huang

Prevention of GRED After Sleeve Gastrectomy: Crual Repair

for Whom?

Dr. Kazunori Kasama

Learning curve in LRYGB **Dr. Jaideepraj Rao** 







#### Friday 25 April 2014

Section: Surgical Technique of Redo-Operation (VDO Section)

Time: 10.30-12.00
Tonsai Room

Chairman: Dr. Panot Yimcharoen

Dr. Nik Rirza Kosai Dr. Simon Wong

Reversal of RYGB **Dr. Manish Baijal** 

Laparoscopic Conversion of Roux-en-y Gastric Bypass to Sleeve Gastrectomy

Dr. Aparna Govil Bhasker

Few Difficult Cases on Revisional Sugery with Video

Dr. Ken Loi

Single Incision Revisional Sleeve to Bypass - Video

Dr. Praveen Palanivelu Raj

Lap Revision of Stricture After Leakage Post - Sleeve Gastrectomy

Dr. Shashank S. Shah

Heller Myotomy After LSG in Patient with Previous Hepaticojejunostomy

Dr. Asim Shabbir

Laparoscopic Correction of a Gastrocolic Fistula Following a Leak After Sleeve Gastrectomy

Dr. Aparna Govil Bhasker







#### Friday 25 April 2014

Section: Metabolic Surgery Time: 13.00-14.30

**Chonlatee Room** 

**Chairman:** Dr. Thanyadej Nimmanwudipong

Dr. Jimmy So Bok Yan

Dr. Camilo Boza

Dr. Shashank S. Shah

LSG + DJB for Metabolic Sugery: Update and Result

Dr. Kazunori Kasama

Metabolic Surgery in Low BMI

Dr. Hui Liang

Sleeve Gastrectomy and Dyslipidemia

Dr. Jayashree Todkar

Discussion

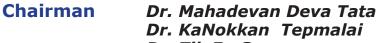




#### Friday 25 April 2014 Section: Free Paper 9-14

Time: 13.00-14.30

#### **Tonsai Room**



Dr. Tik Fu Gee

13.00-13.10 9. The Impact of the Learning Curve on Morbidity in Bariatric Surgery at the Singapore General Hospital

> Pasupathy S1 Ganguly S2 Tan Hc2 Tham Kw2

13.11-13.21 10. Is Elective Oesophagogastroduodenoscopy Prior to Bariatric Surgery in a ASIAN Cohort a Worthwhile Procedure?

Cheng KS Anton2 Na JY1 Kong Lucy2 So BY Jimmv1, 3 Lomanto Davide1, 3 Kim G1 Chen L1 Khin Thida Soe3

Shabbir Asim1, 3

13.22-13.32 11. Protocolised Weight Loss Program Improves Weight

Loss After Sleeve Gastrectomy

Kim Guoweil Tan Chuen Seng2, 5

Cheng Kui Sing Anton3 Rao Jaideepraj4

Khin Thida Soe5 Kong Lucy3 Lomanto Davide1, 5 Chen Litang1 Ng Jing Yu1 So BY Jimmy1 5

Shabbir Asim1, 5

13.33-13.43 12. Laparoscopic Adjustable Gastric Banding (LAGB) with

Gastric Plication: Short-Term Results and Comparison with

LAGB Alone and Sleeve Gastrectomy

Pakkavuth Chanswangphuvana

Jung-Chien Chen MD Wei-Jei Lee MD., PhD

Kong-Han Ser MD Jun-Juin Tsou, SPN Yi-Chih Lee MHA.

13.44-13.54 13. Gastro-Esophageal Reflux Disease Symptoms After Laparoscopic

Sleeve Gastrectomy in Morbidly Obese Patiens

Ajjana Techagumpuch Krit Kitisin Suppa-ut Pungpapong Chadin Tha

Chadin Tharavei

Patpong Navicharern Suthep Udomsawaengsup

13.55-14.05 14. Comparison Between Laparoscopic Sleeve Gastrectomy an Laparoscopic ROUX-EN-Y Gastric Bypass Effect on Diabetes Control

: A Preliminary Report of a Prospective Randomized Clinical Trial

Ajjana Techagumpuch MD. 1

Pakkavuth Chanswangphuvana MD. 2

Soravith Vijitpornkul MD. 2 Teeranun Tiyapanjanit MD. 2

Chadin Tharavej MD. 2

Suppa-ut Pungpapong MD. 2

Patpong Navicharern MD. 2 Suthep Udomsawaengsup MD. 2 Pondech Vichajarn

# 9. The Impact of the Learning Curve on Morbidity in Bariatric Surgery at the Singapore General Hospital

Pasupathy S1 Ganguly S2 Tan Hc2 Tham Kw2

- 1. Department of Upper GI and Bariatric Surgery, Singapore General Hospital, Singapore
- 2. Department of Endocrinology, Singapore General Hospital, Singapore

**Background:** Bariatric surgery is one of the most effective weight loss interventions for morbidly obese individuals. However, there is a great deal of concern on the part of physicians and patients regarding surgical morbidity in these patients. Surgical outcomes are understood to improve with increasing surgical experience, a concept referred to as the learning curve.

**Aim of Study:** To delineate the learning curve of a dedicated bariatric surgery team in a tertiary level academic medical centre.

**Methods:** In 2008, a dedicated weight management service was set-up at the Singapore General Hospital. The service comprised obesity endocrinologists, clinical coordinators, exercise therapists, bariatric dietitians and bariatric surgeons housed in a single facility. Patients were managed according to a clinical pathway which included pre-surgical evaluation, surgical admission and post-surgical follow-up. The operative outcomes of the first 200 patients who underwent bariatric surgery performed by a single surgeon are reviewed here.

**Results:** From September 2008 – December 2013, 200 patients underwent bariatric surgery under the same surgeon. The mean pre-operative weight was 118 kg (range 78 – 205) and body mass index (BMI) 42 kg/m2 (32.5 – 70). A comparison was made of the first 100 and second 100 patients. In the first cohort, there were 62 sleeve gastrectomies (SG), 18 mini-gastric bypasses (MB) and 18 Roux-en-Y gastric bypasses (RY). The distribution in the second cohort was 61, 24 and 15 respectively. All procedures were completed laparoscopically. Operative times in the first cohort ranged from 134 – 286 min and reduced to 116 – 184 min in the second cohort. Average length of stay reduced from 3.2 (+/-3) days to 2.4 (+/-1) days. In the first cohort, there were 4 major complications requiring re-operations (2 for haemorrhage, 1 for anastomotic leak and 1 for intestinal obstruction). In the second cohort there were no re-operations. There were no procedure-related mortalities.

**Conclusion:** Our initial experience demonstrates trends that support the presence of a learning curve in bariatric surgery.





# 10. Is Elective Oesophagogastroduodenoscopy Prior to Bariatric Surgery in a ASIAN Cohort a Worthwhile Procedure?

Ng JY1
Cheng KS Anton2
Kong Lucy2
So By Jimmy1, 3
Lomanto Davide1, 3
Kim G1, Chen L1
Khin Thida Soe3
Shabbir Asim1, 3

- 1. National University Hospital, Singapore
- 2. Khoo Teck Puat Hospital, Singapore
- 3. National University of Singapore

**Background:** The pre-operative use of Oesophago-gastro-duodenoscopy (OGD) for patients undergoing bariatric surgery remains controversial. In Asia where there is a high prevalence of upper gastrointestinal pathologies, its utility is not well studied.

**Aim of Study:** To identify the most common findings on OGD in asymptomatic individuals undergoing bariatric surgery and if they change in clinical management was warranted with an intention to update current practice.

**Methods:** We reviewed data of all patients undergoing OGD prior to bariatric surgery at the National University Hospital and Khoo Teck Puat Hospital, Singapore between the years 2006-2013. Patients with GI symptoms were excluded.

**Results:** There were 208 patients who satisfied the criteria. OGD was normal in 70 (33.6%) of them. The most common findings were gastritis 49.5% (n=103), hiatal hernia 15.9% (n=33), esophagitis 9.1% (n=19) and peptic ulcer disease 4.8% (n=10). 5.3%(n=11) had benign polyps. One patient had gastrointestinal stromal tumour. Helicobacter Pylori associated gastritis was found in 13.9% (n=29). 4.3% (n=9) had significant changes to their operative management. 2.4% (n=5) patients had their surgeries delayed for over 3 months to treat underlying conditions. One patient had an incidental gastro-esophageal junction cancer and underwent endoscopic submucosal dissection. Two patients had concurrent hiatal hernia repair and one patient had a scheduled gastric bypass changed to sleeve gastrectomy because of peptic ulcer disease.

**Conclusion:** In our practice, routine pre-operative OGD had a high diagnostic yield. Our current experience supports the use of routine preoperative OGD prior to bariatric surgery in Singapore for now.

### 11. Protocolised Weight Loss Program Improves Weight Loss After Sleeve Gastrectomy

Kim Guowei1 Tan Chuen Seng2, 5
Cheng Kui Sing Anton3 Rao Jaideepraj4
Khin Thida Soe5 Kong Lucy3
Lomanto Davide1, 5 Chen Litang1
Ng Jing Yu1 So By Jimmy1, 5
Shabbir Asim1, 5

- 1. National University Hospital, Singapore
- 2. Saw Swee Hock School of Public Health, Singapore
- 3. Khoo Teck Puat Hospital, Singapore
- 4. Tan Tock Seng Hospital, Singapore
- 5. National University of Singapore

**Background:** Laparoscopic sleeve gastrectomy has gained popularity in recent years. No study to date has looked into the role of a standardized weight loss protocol and its effect on excessive weight loss.

**Aim of Study:** To determine if a protoclised weight loss program improves weight loss after sleeve gastrectomy

**Methods:** We compare weight loss outcomes of laparoscopic sleeve gastrectomy in three bariatric centers in Singapore from April 2010 to July 2013. One center utilizes a standardized weight loss protocol where patients were given weight loss targets to achieve. Results from this center are compared with the other centers which do not utilize any protocols.

**Results:** A total of 187 patients were studied with 116 patients who followed a standardized weight loss protocol. The groups where comparable for gender, ethnicity, pre-operative comorbidities, age, height and pre-operative weight/excessweight/BMI. At 3, 6, 9 and 12 months post-sleeve gastrectomy mean excessive weight loss (EWL) was 40%, 54%, 63% and 65% as compared to 36%, 50%, 50% and 53% respectively in the none protocol based group. These results were statistically significant (P <0.05) at 9 and 12 months. Using the generalized estimating equations approach to fit the linear regression to the longitudinal EWL data, there was significant difference in the difference in estimated marginal mean of EWL between the groups; 5.63% (95%CI: 0.72 to 10.5).

**Conclusion:** Our results suggest that the use of a standardized weight loss protocol for patients who have undergone laparoscopic sleeve gastrectomy improves weight loss outcomes in the short to mid-term period.





# 12. Laparoscopic Adjustable Gastric Banding (LAGB) with Gastric plication: Short-Term Results and Comparison with LAGB Alone and Sleeve Gastrectomy

Wei-Jei Lee MD., PhD. Jung-Chien Chen MD. Kong-Han Ser MD. Jun-Juin Tsou, SPN. Yi-Chih Lee MHA.

Min-Sheng General Hospital, National Taiwan University, Taiwan

**Background:** Laparoscopic Adjustable Gastric Banding (LAGB) is the safest type of bariatric surgery but is less effective than other bariatric surgeries. Combining LAGB with gastric plication (LAGB-P) may increase weight loss compared to LAGB alone.

**Methods:** Forty-two morbidly obese patients underwent LAGB-P and were followed for 12 months. Operative complications, weight loss and late complications were followed and compared with matched groups of LAGB alone and laparoscopic sleeve gastrectomy (LSG).

**Results:** The study consisted of 42 patients, specifically 21 males and 21 females with an average age of 32.6 + 9.7 years (range 18 to 58) and a mean BMI of 40.7 + 6.1 Kg/m2(range 31.5 to 56.4). The mean operation time was 141.9 + 24.8 minutes (range 105 to 190), and the mean hospital stay was 2.3 + 1.9 days. Two (4.8%) major complications were encountered and resolved by laparoscopic revision surgery. There was one (2.4%) major complication in the LSG group and none in the LAGB group. The operation time for LAGB-P was than for LAGB and LSG. The mean BMI of the LAGB-P group decreased from 40.7 to 29.4 Kg/m2 at one-year after surgery, with an excess weight loss of 62.6%. This result is similar to the 67.2% excess weight loss in the LSG group, but is higher than the 31.7% excess weight loss of the LAGB group. At follow-up, revision surgery was required in 2 (4.8%) patients in the LAGBP group, none (0%) in the LAGB group and 1(2.4%) in the LSG group. More patients in the LSG group still required PPI treatment at one-year after surgery than the other two groups

**Conclusion:** By combining LAGB with gastric plication, LAGB-P can augment the weight loss of LAGB and is similar to LSG but may increase risk.



### 13. Gastro-Esophageal Reflux Disease Symptoms After Laparoscopic Sleeve Gastrectomy in Morbidly Obese Patiens

Pakkavuth Chanswangphuvana Pondech Vichajarn Ajjana Techagumpuch Krit Kitisin Suppa-ut Pungpapong Chadin Tharavej Patpong Navicharern Suthep Udomsawaengsup

Chula Minimally Invasive Surgery Center, Department of Surgery, Faculty of Medicine, King Chulalongkorn Memorial Hospital, Chulalongkorn University, Bangkok, Thailand

**Background:** Gastro-Esophageal Reflux Disease (GERD) is prevalent in morbidly obese patients. It is well established that Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) produces improvement in GERD symptoms. Laparoscopic Sleeve Gastrectomy (LSG) has become popular in recent years. However, less was known regarding effect on GERD symptoms after LSG. This study compares GERD symptoms after LSG and LRYGB in morbidly obese patients.

**Methods:** A retrospective, group-matched controlled analysis was performed in 162 patients who underwent LSG and LRYGB at our institute by one surgeon between January 2010 and July 2013. Patients were matched for body mass index (BMI) 40-60 and then interviewed by phone for GERD symptoms in January 2014. Patients scored GERD symptoms on severity scale from 0 to 3. Outcome measures were postoperative GERD symptoms and percentage of excess weight loss (%EWL).

**Results:** 35 patients underwent LSG and 49 patients underwent LRYGB. Prior to operation, GERD symptoms were no significant difference (42.8% in LRYGB and 45.7% in LSG). Overall postoperative GERD symptoms were no significant difference (p=0.48). Subgroup analysis of postoperative GERD symptoms were no significant difference in complete resolution, improvement, progression and new-onset of GERD symptoms. At 6 months follow-up, %EWL was no significant difference (42.9% in LSG vs 48.5% in LRYGB, p=0.14).

**Conclusion:** Laparoscopic Sleeve Gastrectomy has beneficial effect on relieving GERD symptoms and results in success weight loss. However, some has experience in progression or new onset of GERD symptoms. Further randomized studies with objective measurement of GERD symptoms are needed.







# 14. Comparison Between Laparoscopic Sleeve Gastrectomy an Laparoscopic ROUX-EN-Y Gastric Bypass Effect on Diabetes Control: A Preliminary Report of a Prospective Randomized Clinical Trial

Ajjana Techagumpuch MD.1
Pakkavuth Chanswangphuvana MD.2
Soravith Vijitpornkul MD.2
Teeranun Tiyapanjanit MD.2
Chadin Tharavej MD.2
Suppa-ut Pungpapong MD.2
Patpong Navicharern MD.2
Suthep Udomsawaengsup MD.2

- 1. Department of Surgery, Thammasat University, Thailand
- 2. Department of Surgery, King Chulalongkorn Memorial University, Bangkok, Thailand

**Background:** Bariatric surgery has been demonstrated efficacy on weight loss and also the comorbidity resolution especially diabetes. Gastric bypass(LRYGB) is still the standard procedure and thought to has the major role in glucose homeostasis and diabetes control. Sleeve gastrectomy(LSG) is gaining the popularity as an option procedure in morbid obese patient with comparable outcome to gastric bypass in previous study. However there is still lack of data in Thailand.

OBJECTIVE: Primary end point is to glycemic control at 6 months after LSG and LRYGB surgery. Secondary outcome is to evaluation of excess weight loss.

**Methods:** A prospective, randomized clinical trial in morbid obese patient with type 2 diabetes(T2DM). This study performed in Thai patient with age between 15-60 years, BMI 32.5-60, history of T2DM less than 10 years and preoperative HbA1c more than 7.0. At 6 months after surgery to evaluate fasting plasma glucose, HbA1c, % excessive weight loss and the reduction of antihyperglycemic drugs use.

RERULT: 28 patients were randomized to 15 patients in LSG group and 13 patients in LRYGB group. Average EWL was 32.76% in LSG group and 55.07% in LRYGB group (P=0.02). reduction in mean HbA1c level from 9.01 to 5.72 in LSG group and from 8.93 to 5.56 in LRYGB group (P=0.343). Both groups show decrease of FPG and antidiabetes drugs use after surgery but no statistic significant diffenrence beween two groups.

**Conclusion:** LRYGB is more effective on weight loss with statistic significant. However Sleeve gastrectomy may have comparable effect in diabetic control to LRYGB.







Saturday 26 April 2014 **Section: Innovation!** 

Time: 09.00-11.30

**Chonlatee Room** 



**Chairman:** Dr. Poochong Timratana

Dr. Panot Yimcharoen

Intragastric Balloon Dr. Wilfred Mui

Endoscopic Revision of Gastrojejunostomy after Gastric Bypass

Dr. Simon Wong









Saturday 26 April 2014 Section: Free Paper 15-19

> Time: 09.00-11.30 **Tonsai Room**

Chairman: Dr. Allen Alfred Buenafe

Dr. Suriva Punchai

Dr. Praveen Palanivelu Raj

09.00-09.10 15. Laparoscopic Sleeve Gastrectomy for Morbidly Obese Adolescent

Singaporeans: ASIAN Perspective

Soe Khin Thida1 **Dolaunov Dmitrii 2** Lomanto Davide1, 2 Chen L1, So BY Jimmy1, 2 Shabbir Asim1, 2

09.11-09.21 16. Laparoscopic Sleeve Gastrectomy As A Stand Alone Bariatric Procedure In Management Of Type 2 Diabetes Mellitus In Obese

Indians.

Sushant Wadhera Sudhir Kalhan Suvirai John Mukund Khetan Parveen Bhatia

09.22-09.32 17. Efficacy of MGB in Morbidly Obese With Type 2 Diabetes Mellitus

In UAE

Sharjah Experience

Tarek Mahdi

Abdulwahid Alwahdi

09.33-09.43 18. Bariatric surgery improves renal function of patients of diabetes

mellitus type 2 (T2DM) after one year.

Hashimoto, Kenkichi, Seki, Yosuke, Kasama, Kazunori

09.44-09.54 19. Laparoscopic sleeve gastrectomy with duodenojejunal bypass (LSG-DJB) for diabetic Japanese patients with BMI less than 35 kg/

m2

Yosuke Seki

Kenkichi Hashimoto Kazunori Kasama



### 15. Laparoscopic Sleeve Gastrectomy for Morbidly Obese Adolescent Singaporeans: ASIAN Perspective

Soe Khin Thida1
Dolgunov Dmitrii2
Lomanto Davide1, 2
Chen L1,
So BY Jimmy1, 2
Shabbir Asim1,2

- 1. National University of Singapore
- 2. National University Hospital, Singapore

**Objectives:** The aim of this study is to evaluate outcomes and effectiveness of bariatric surgery in adolescents and to examine the associated factors of adolescent obesity in Singapore.

**Methods:** Patients younger than 20 years who underwent laparoscopic sleeve gastrectomy (LSG) between 2011- 2013 at the National University Hospital, Singapore, were selected. This is a retrospective review of prospectively collected data. This study will describe pre-operative anthropometrics, co morbidities, weight loss and body composition outcomes.

Results: Twelve LSG on obese adolescents were performed constituting 7.4% of all LSG. Mean age (SD) was 19.25 years (+0.7) and the pre-operative mean body mass index (BMI) was 47 (+8.5) kg/m2. 66.7% had 1-2 comorbid conditions and another 25% had 3 or more upon presentation. 50% of patients had family history of obesity, 42% never exercised and 91.6% had regular intake of high calorie drink. The most common conditions found were obstructive sleep apnea (58.3%), hypertension (50%), asthma (33.3%), diabetes mellitus and hernia (25%). The mean excess weight loss was 70% at 1 year with mean BMI dropping to 29.8 (23-37) kg/m2. Patients reported a mean pain score of 2 at 24 hours post surgery. Length of post-operative stay was 2 days with patient ambulating in less then 24hrs after surgery and started drinking on post op day 1. There were no mortalities, complications or readmissions to report. The mean fat mass changed by 25kg at 1 year. Remission of comorbidities was reported in 2 out of 3 diabetic patients, 4 out of 5 hypertensive patients within 1 year of surgery.

**Conclusion:** Laparoscopic sleeve gastrectomy for weight loss is a safe option in Asian adolescents with good short-term weight loss outcomes.





## 16. Laparoscopic Sleeve Gastrectomy As A Stand Alone Bariatric Procedure In Management Of Type 2 Diabetes Mellitus In Obese Indians.

Sushant Wadhera Sudhir Kalhan Suviraj John Mukund Khetan Parveen Bhatia

Institute of Minimal Access, Metabolic and Bariatric Surgery, Sir Ganga Ram Hospital, New Delhi, India

**Objectives:** To evaluate the efficacy of Laparoscopic Sleeve Gastrectomy as a stand alone Bariatric Procedure In Management Of Type 2 Diabetes Mellitus with Obesity in the Indian subcontinent.

Materials & Methods: 304 patients of Morbid Obesity (BMI > 32.5) with Type 2 Diabetes Mellitus (FBS > 126 mg /dl and HbA1C > 6.5 as per WHO), underwent Laparoscopic Sleeve Gastrectomy between January 2010 and January 2013. All patients had a sleeve of stomach created over a 38 Fr Gastric Calibration Tube, starting 4 cm from the pylorus. The staple line was imbricated with PDS 2-0 Suture. All patients had Intraoperative Gastroscopy and underwent a Gastrograffin swallow on First Post Operative day. Preoperatively, baseline levels of Glucose, Insulin & C-Peptide were evaluated in the Fasting and Post Prandial states. The fasting level of Glycated Haemoglobin (HbA1C) was also measured. The HOMA-IR index was calculated. Postoperatively patients were re-evaluated at 1 month, 6 month and 1 year. Retrospective analysis of the data was done.

**Results:** In the retrospective analysis of our data we found that there was resolution of Diabetes in (92 %) of cases (Resolution defined as HbA1 C< 6.5 and FBG < 126 mg/dl. The FBS decreased from a mean value of (151 mg/dl) preoperatively to a mean value of (114 mg/dl) at 1 months; (107 mg/dl) at 6 months and (101 mg/dl) at 1 year. Both fasting and postprandial Insulin decreased from preoperative levels of (31.8  $\mu$ U/mL) & (65.7  $\mu$ U/mL) to (10.5  $\mu$ U/mL) & (11.6  $\mu$ U/mL) at 1 Month; (3.2  $\mu$ U/mL) & (12.8  $\mu$ U/mL) at 6 months and (3.5  $\mu$ U/mL) & (11  $\mu$ U/mL) at 1 year respectively. The mean value of HOMA- IR decreased from 11.95 preoperatively to 3.32 at 1 month; 2.12 at 6 months and 1.18 at 1 year.

**Conclusion:** We conclude that Laparoscopic Sleeve Gastrectomy as a Stand Alone Bariatric Procedure in Management of Type 2 Diabetes Mellitus with Obesity in the Indian subcontinent is a feasible option. It provides an excellent quality of life post operatively without causing nutritional deficiencies. We believe that the need of the hour for Indian populations is to Restrict more and malabsorb less.



### 17. Efficacy of MGB in Morbidly Obese With Type 2 Diabetes Mellitus In UAE, Sharjah Experience

Tarek Mahdi Abdulwahid Alwahdi

ALQassimi Hospital

**Objective:** Many reports have showed that patients who have undergone laparoscopic MGB have experienced resolution of type 2 diabetes. The UAE ranks as the fifth fattest nation in the world, and the diabetes rate of roughly 20 percent for residents and 25 percent for Emirati nationals. The aim of our study was to evaluate the efficacy and safety of LMGB in morbidly obese UAE subjects with type 2 diabetes mellitus.

**Methods:** From Marsh 2011 to december 2013, morbid obese patients with T2DM underwent LMGB enrolled in this study. The change in fasting blood sugar, postprandial blood sugar, and glycosylated hemoglobin, C-peptide, total body weight and the use of oral hypoglycemic agents and insulin at the end of one year were studied.

**Results:** A total of 135 patients with type 2 diabetes mellitus (95 women and 40 men age  $40.5 \pm 7.9$  years, body mass index  $48.7 \pm 7.6$  kg/m2, and hemoglobin A1c  $8.9\% \pm 1.6\%$ ) had undergone LMGB. Before MGB, 110 patients (81.5%) required oral hypoglycemic agents and 25 patients (18.5%) required oral hypoglycemic agents and insulin). Resolution of type 2 diabetes was achieved in 108 (80%), remission in 25 (18.5%) and stable in 2 (1.5%) patients at one year after LMGB. The diabetes resolution rates for those with pre-operative C-peptide <3, 3--6, and >6 ng/mL were 3 /25 (12%), 85/90 ( 94.4%) and 20/20 (100%), respectively.

**Conclusion:** MGB is an effective the treatment of T2DM in morbidly obese UAE patients. C-peptide as the predictor of successful T2DM resolution should be evaluated and used as patient selection criteria. The possible mechanisms explaining improvement in glycemic control need further investigation.







### 18. Bariatric Surgery Improves Renal Function of Patients of Diabetes Mellitus Type 2 (T2DM) After One Year

Hashimoto Kenkichi Seki Yosuke Kasama Kazunori

Weight Loss and Metabolic Surgery Center Yotsuya Medical Cube

**Background:** Obesity is a risk factor for developing diabetes mellitus type 2 (T2DM) and chronic kidney disease (CKD). Bariatric surgery can improve T2DM, and may also improve renal function. The objective of this study was to investigate changes in the estimated glomerular filtration rate (eGFR) and proteinurea in morbid obese patients in a year after bariatric surgery.

**Methods:** eGFR was measured in 137 morbid obese patients with T2DM before and one year after bariatric surgery (LSG 40, LRYGB 22, LSG + DJB 75). Patients were separated by eGFR: hyperfiltration (eGFR>125 mL/min), normal range (eGFR 90-125 mL/min), CKD stage 2 (eGFR 60-89 mL/min), and stage 3 (30-59 mL/min) and stage 4 (15-29 mL/min). And urinary protein was examined qualitatively in 75 patients with severe T2DM performed LSG + DJB. Patients were separated into improved, unchanged and progressive groups. Each factor was analysed between improved and progressive groups.

**Results:** Of the 137 patients, 25 (18.2%) had hyperfiltration, 68 (49.6%) were normal range, 36 (26.3%) were stage 2, and 8 (5.8%) were stage 3, and the mean eGFR was  $101.2 \pm 29.6$  mL/min before the operation. 125 patients can be followed at one year after the operation. 14 (11.2%) had hyperfiltration, 61 (48.8%) were normal range, 43 (34.4%) were stage 2, 6 (4.8%) were stage 3, and 1 (0.8%) were stage 4 and the mean eGFR was  $95.4 \pm 25.5$  mL/min. The hyperfiltration group decreased, but it was difficult to know that they were improved or progressive only by eGFR. 75 patients with severe T2DM performed LSG + DJB were examined urinary protein qualitatively, and 66 patients can be followed. 30 patients (45.5%) were improved, 27 (40.9%) were stable or unchanged, and only 7 (10.6%) were progressive. Each factor was analysed between improved and progressive groups, and the percentage of excess weight loss (%EWL), postoperative BMI and delta TC were statically significant, and delta HbA1c, delta LDL and delta TG were tend to be higher in the improved group.

**Conclusion:** Abnormal renal function was common in morbid obese patients with T2DM. Bariatric surgery-induced weight loss and improvement of T2DM and dyslipidemia may be related to improvement of urinary protein.



# 19. Laparoscopic sleeve gastrectomy with duodenojejunal bypass (LSG-DJB) for diabetic Japanese patients with BMI less than 35 kg/m<sup>2</sup>

Yosuke Seki Kenkichi Hashimoto Kazunori Kasama

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**Background:** Gastrointestinal bypass surgery, such as Roux-en-Y gastric bypass and DS, has been well known to its significant clinical effect on type 2 diabetes mellitus (T2DM). Most of the related studies have targeted Caucasians with BMI more than 35 kg/m2. There is no data targeting Japanese diabetic patients with BMI less than 35 kg/m2.

**Aim of Study:** To investigate the clinical effect of LSG-DJB on T2DM in mild to moderate obese Japanese.

**Methods:** Since 2011, we've conducted the clinical trial "LSG-DJB for Asian T2DM with BMI from 27.5 to 34.9 kg/m2 (UMIN000005716)". To date, the procedures have performed on 26 patients. To elucidate the mechanism of action, meal challenge tests preand 6 months after surgery were routinely performed and a variety of GI hormones were measured.

**Results:** At baseline, mean age 46.2 (F/M=14/12), BW 85.9 kg, BMI 31.0 kg/m2. 16 out of the 26 patients were treated with insulin and 14 patients were treated with incretin related drugs. Mean HbA1c was 9.1% and the duration of T2DM was 9.2 years. OP time was 216 min, blood loss was 22 ml and post-OP hospital stay was 3.1 days. No serious complications and no mortality. Remission of diabetes (HbA1c< 6.5% without medication) was achieved in 62% of the cases. Patients in the remission group improved insulin resistance significantly compared to those in the non-remission group.

**Conclusion:** Our preliminary results indicate that LSG-DJB is a strong treatment for advanced diabetes associated with mild to moderate obesity.









# Poster Presentation





### 1. Deep Vein Thrombosis Post Laparoscopic Bariatric Surgery: Two Cases Report

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**Objective:** Morbid obesity is one of the 21st century epidemics. Surgery is the most important and cost- effective treatment. Venous thromboembolism (VTE) is uncommon complication of bariatric surgery but a leading cause of postoperative mortality. The National Institute of Health and Clinical Excellence (2010) guidelines on VTE indicate that patient with a BMI of more than 30 kg/m2should be assessed and treated prophylactically either using anti-embolic stockings or subcutaneous anticoagulant (or both) depending on the type of bariatric surgery.

**Materials & Methods:** We report two cases of deep vein thrombosis (DVT) after bariatric surgery.

**Results & Conclusion: Case 1**: A 40-year-old female with morbid obesity (BMI: 35.7 kg/m2) underwent laparoscopic mini-gastric bypass. She was admitted 10 days after discharged due to bilateral legs pain (L > R) for 2 days. Vital signs were normal. Physical examination revealed tender swelling both lower legs (L > R), with positive Homan's sign left side. All blood investigation were normal except white blood cell count 18130/uL. Duplex ultrasonography shows left popliteal deep vein thrombosis. Patient kept on low molecular weight heparin (LMWH) with enoxaparin 6000 iu subcutaneously twice daily with intermittent calf pneumatic compression. Patient improved and was discharged on the 9 th day on Warfarin, and given OPD follow-up.

kg/m2) and hyperlipidemia underwent laparoscopic sleeve gastrectomy. She was admitted 7 days after discharged due to left lower leg pain for 3 days. Vital signs were normal. Physical examination revealed tender swelling of left lower leg, with positive Homan's sign. All blood investigation were normal. Ultrasonography shows left popliteal and left calf deep vein thrombosis. Patient kept on LMWH with enoxaparin 6000 in twice daily with intermittent pneumatic calf compression. Patient improved and was discharged on the 10 th day on Warfarin, and given OPD follow-up. In conclusion: Obesity is a recognized risk factor for VTE. It can occur 1 to 2 weeks postoperatively. Reported rates of VTE following bariatric surgery are 0.2% to 3.5%. Incidence in Asia is low (1.5%).

In these two cases, there was no prophylaxis before operation. In our center experiences, the incidence of DVT after bariatric surgery was low 0.05% (2/4000). Preoperative screening for risk factors of DVT is important. At present, there is no general consensus regarding the best protocol. Further large randomized trial is needed to provide clear indications for anticoagulant use and the risks of bleeding event in these patients.





### 2. Clinical Experience of Weight Loss Surgery in Morbidly Obese Korean Adolescents

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**Background:** Comprehensive multidisciplinary weight management programs encompassing various conservative measures have shown only modest weight loss results in obese children and adolescents; therefore, bariatric surgery for this population has become a matter of debate. This study aimed to present our experience with and outcomes for laparoscopic sleeve gastrectomy (LSG) and laparoscopic Roux-en-Y gastric bypass (LRYGB) in morbidly obese Korean adolescents.

**Methods:** The prospectively established database of all patients undergoing bariatric surgery at Soonchunhyang University Seoul Hospital, Korea between January 2011 and January 2013 was retrospectively reviewed. Adolescents 7aged 14 to 20 years were included in the present analyses.

**Results:** Twenty-two adolescents underwent bariatric surgery during the study period; 14 underwent LSG and 8, LRYGB. Of these, 17 were female and 5 were male. The mean age was 19 years. Their mean body weight and body mass index (BMI) before surgery were 115 kg and 40.1 kg/m2. The only postoperative complication was intraluminal bleeding in 1 patient, which was managed conservatively. The mean BMI decreased to 29.1 kg/m2 after a mean follow-up of 10 months. The percent excess weight loss (%EWL) at 1, 3, 6, and 12 months postoperatively were 19.6, 39.9, 52.6, and 74.2%, respectively. Only 1 patient showed %EWL less than 30% at 12 months after surgery. All patients with diabetes and sleep apnea were cured of their disease, and other comorbidities also improved or resolved after surgery.

**Conclusion:** Bariatric surgery leads to significant short-term weight loss along with resolution of obesity-related comorbidities in obese children and adolescents.





### 3. Bariatric Surgery; 5-Year Single Center Experience in South Korea

#### Yong Jin Kim

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Obesity has become one of the most important public health problem world-wide. Obesity is closely associated with various medical conditions such as hypertension, diabetes, obstructive sleep apnea, dyslipidemia, gastroesophageal reflux disorder, arthropathy, and coronary artery disease, as well as with increased mortality and reduction in life expectancy.

These conditions could be significantly improved or cured by losing weight, but none of the conventional conservative measures including lifestyle modification and medical treatment showed satisfactory results in terms of sustained weight loss and clinical improvement of comorbidities.

In the meanwhile, several studies have demonstrated that bariatric surgery is effective in achieving sustained weight loss, reducing obesity-related comorbidities, as well as in improving quality of life in the long-term. The Swedish Obese Subjects Trial (SOS trial), the largest clinical trial comparing surgical versus medical treatment of severe obesity, revealed the striking benefits of bariatric surgery on obesity-related morbidity in contrast with relatively disappointing results of medical and behavioral treatment. Since then, there has been increasing interest in bariatric surgery as a measure to manage obesity and its comorbidities at the same time.

As the efficacy and safety is demonstrated, bariatric surgery has become remarkably popular throughout the world accordingly and also in Asian countries over the last decade. Since 2009, the number of bariatric surgery performed in South Korea also has exponentially increased along with the trend in Asia and surpassed 1000 cases of annual performance. Here, we report our experience in bariatric surgery at a single specialized center in South Korea.







### 4. Changes in Serum Level of Soluble Fibrin After Laparoscopic Sleeve Gastrectomy

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**Objective:** Pulmonary embolism (PE) is one of major complications after bariatric surgery. The fibrin-related markers, including D-dimer and soluble fibrin (SF) are considered to be sensitive biomarkers for thrombosis. We estimated serum of SF after laparoscopic sleeve gastrectomy (LSG) for detecting PE.

**Materials & Methods:** Seventeen patients with morbid obesity underwent LSG between 2008 and 2013. All of them measured serum level of SF on the day of operation, postoperative day 1, 2, 5, 7, and 9.

**Results:** One of our seventeen patients detected PE on the fifth day after LSG. The serum level of SF on the day of operation, on postoperative day 1, 2, 5, 7, and 9 of sixteen patients without PE were 1.8+-2.3 microg/ml, 2.8+-2.0 microg/ml, 3.2+-2.4 microg/ml, 3.6+-1.8 microg/ml, 4.4+-4.1 microg/ml, 3.5+-0.6 microg/ml, respectively. The serum level of SF on postoperative day 5 of the patient who detected PE was 80 microg/ml.

The patient who detected PE was a 37-year-old man. He underwent LSG for morbid obesity (BM140.6 kg/m²). His co-morbidities included type 2 diabetes mellitus, hypertension, ischemic heart disease and sleep apnea syndrome. Anticoagulant agent, fondaparinux sodium, was administered from the day after LSG. Five day afer LSG, the plasma SF level was elevated (80.0 microg/ml), otherwise the plasma D-dimer level was slightly elevated (2.2 microg/ml). No symptom like dyspnea or chest pain developed and O2 saturation was 98% on room air as usual. Enhanced CT-scan revealed thrombus in the left lingual branch of pulmonary artery, which was not detected before LSG. Adminnistration of heparin sodium and warfarin potassium was started. Twelve day afrer LSG, thrombus could not be detected by enhanced CT-scan. He was discharged without developing any symptoms.

**Conclusion:** SF has potential to be a useful biomarker for detecting PE after LSG. This study is a pilot study. We would like to estimate the serum level of SF after LSG in many patients to detect PE.



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**Background:** We has demonstrated that Laparoscopic gastric bypass surgery (LGB) is more effective than Laparoscopic sleeve gastrectomy (LSG) for surgical treatment of poorly controlled type 2 diabetes(T2DM) in our previous study. However the quality of life comparing LSG and LGB are lacking.

**Methods:** This study is an ongoing 3-year prospective study to assess the progressive weight reduction, diabetes remission and Gastro-Intestinal Quality of Life Index (GIQ-LI) results after LSG and LGB. The GIQLI was estimated using a 36-item questionnaire with a scoring system.

**Results:** There was 309 patients recruited, 143 undergone LSG (mean age: 34.8±;10.1; Female79 (55.2%); body mass indexBMI: 38.7±7.5; DM duration1.74±3.2 year); 166 undergone LGB (mean age: 41.1±11.3; Female118 (70.7%); body mass inde xBMI:39.95±7.6; DMduration5.97±4.0 year). LGB group had older age and longer DM duration(P=0.000; P=0.025). There was no different in the excess weight loss (28.7 vs.30.3) and mean BMI (26.9 vs.27.1) after surgery between the two groups at 3-year. Preoperative GIQLI scores was similar between the two groups (104.3 vs.107.2). At 3-year after surgery, the mean GIQLI score was significantly higher than the Preoperative score in both group (114.2 vs.116.3) but without difference before surgery. Significantly higher subtotals were found in both groups at the domains of physical and social function. There was significantly change in the subtotal domains of emotional function in sleeve group (11.6 vs.16.1, P=0.002).

**Conclusion:** In this study, both LSG and LGB are effective treatment of T2DM without difference. Both procedures can improve the quality of life in T2DM but may induce some gastro-intestinal symptoms.







### 6. Laparoscopic Conversion of Gastric Bypass to Sleeve Gastrectomy for Intractable Anemia

#### Chun Chi Wu

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**Objective:** Gastric bypass is the most common bariatric surgery, however, post-operative iron deficiency and anemia caused by nutrient deficiencies and chronic blood loss are frequently seen. Intractable anemia may result from poor intake, malabsorption, and mucosal bleeding from marginal ulcer. This article report the outcomes of laparoscopic conversion of gastric bypass(GB) to sleeve gastrectomy(SG) in intractable anemia cases.

**Materials & Methods:** Total eight patients (F/M=7/1, mean age 32.6) were included, all received either Roux-en Y or mini-gastric bypass originally, then subsequent laparoscopic conversion for intractable anemia was performed during December 2010 to December 2012. At the time of conversion, mean BMI and Hb was 24.2±4.7 kg/m2 and 6.68±1.73g/dL. Mean interval between GB and conversion to SG was 67.7±23.2 months. The operation included dismantling of gastrojejunostomy, restoration of gastric and intestinal continuity and SG.

**Results:** The mean operation time was 167±32min. and mean blood loss was 84ml. There was no conversion to open surgery or mortality, four patients developed post-operative complications as wound infection, staple ulcer bleeding, stenosis of gastric tube and leakage. Mean hospital stay was 8.1 days. At follow-up, the mean Hb returned to 11.7±1.4 g/dL, minor weight gain was observed in two patients (BMI from 24 to 27 and 20.5 to 24). CONCLUSION: Laparoscopic conversion of gastric bypass to sleeve gastrectomy is technically challenging, but a feasible and safe procedure. Remarkable improvement of anemia without significant weight regain was observed during follow-up.



### 7. Metabolic Patients' Motivation for Delaying Surgical Treatment for Type 2 Diabetes in Taiwan

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**Introduction:** Unlike weight loss surgery patients who are often already biased towards a surgical treatment of their problem when they consult with our Bariatric Center, metabolic (diabetic) patients take longer to decide and fewer opt for surgery. We look at the motivation behind these patients' delayed decision and why some eventually decided to have surgery.

**Methods:** Out of the 361 patients who underwent metabolic surgery between January 1, 2011 and December 31, 2013 at our center, 44 (12%) had waited at least six months from the time of their first visit to the center before deciding to undergo surgery. These patients had met the criteria for a high probability for Type 2 Diabetes remission (age, BMI, duration of diabetes, and C-peptide level). We succeeded in conducting an interview with 42 of the 44 patients meeting the profile for our study. The subjects consisted of 19 females and 22 males whose average age was  $43.6 \pm 9.0$  and who had been diagnosed with diabetes for an average of  $6.2 \pm 5.5$  years. The procedural breakdown was 17 bypass surgeries (RY and LMGB), 13 sleeve gastrectomies, 8 gastric sleeve-bypass surgeries, and 2 gastric plications. The subjects were asked to state the reason(s) for delaying surgery and to rank these reasons according to importance. Furthermore, the patients were asked what made them overcome their hesitation and decide to have surgery.

**Results:** The subjects gave 11 different reasons for delaying surgery. However, 3 reasons accounted for 85 percent of the primary reasons to explain their hesitation. Almost half the subjects (20) cited Fear of Surgery as the main reason to avoid the recommended procedure. Financial considerations (8) and Conflicting schedule (7) were the two other reasons most cited. There was more variety among the secondary reasons with No guarantee of success in curing diabetes (8), Family pressure (6), and Belief that I can handle my current condition and life style (5) being the most recurrent. When asked what made them change their mind, the subjects also offered 11 different reasons, although these could be divided into groups. Obviously, many of those who had delayed their decision because of money considerations, or a conflicting schedule, mentioned better financial circumstances and more available time as the main reason for eventually undergoing surgery. However, for many, a deterioration of their condition (i.e. failing to control HbA1c and/or a decrease in kidney function) was the primary (13) or secondary (2) reason for seeking surgery. On the other hand, for others it was positive feedback from former patients (7/3), advice from their treating physician (4/4), or encouragements received from family and friends (2/5) that were the determining factors.

**Conclusion:** Fear of surgery is the most common reason for delaying metabolic surgery. Patients usually overcome their fear when their health deteriorates or following encouragements from their treating physician, relatives, or former patients. These findings suggest that information about the surgery and metabolic surgery support groups will likely help allay fears candidates may experience at first.



#### 8. Early Experience of Bariatric Surgery in Rajvithi Hospital

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**Background:** Obesity is a major public health and economic problem worldwide. Prevalence rates are increasing in all parts of the world. Obesity and health problems associated with them, such as diabetes, hypertension, cardiovascular diseases, dyslipidemia, impaired quality of life, and premature death, are now so common they are replacing more traditional public health concerns such as undernutrition and infectious diseases. Bariatric surgery is the most effective treatment for long-term weight reduction, helping to reduce morbidities, mortalities, and improve quality of life in those affected. Objective: The aim of this study is to report the early outcomes of the Bariatric surgery in Rajavithi Hospital.

Materials & Methods: An observational, retrospective study was carried out at Rajavithi Hospital. From August 2009 to April 2011, 14 patients were submitted for bariatric surgery (Laparoscopic Roux-en-Y Gastric Bypass in 12 patients and Laparoscopic Sleeve Gastrectomy in 2 patients). An assessment was performed for the percentages of excess weight loss, resolution of comorbidities and complications. A retrospective chart review and telephone survey was conducted to determine the occurrence of complications and weight loss.

**Results:** Follow-up data was collected on 13 of the 14 (93%) patients, with a mean follow-up period of  $35.9\pm7.6$  months. The mean preoperative and postoperative body mass index was  $51.0\pm8.7$  kg/m2 and  $32.2\pm4.4$  kg/m2, respectively. The mean excess weight loss was  $72.7\pm17.0\%$ . Of the 13 patients followed up, all patients saw improvement in the treatment of T2DM and hypertension. There were 4(31%) patients with T2DM, cessation of medication was seen in 1(25%) patient, and reduction of medication was seen in 3 (75%) patients. There were 7(54%) patients with hypertension, cessation of medication was seen in 2 (29%) patients, and reduction of medication was seen in 5 (71%) patients. Three (23%) patients had dyslipidemia, cessation of medication was seen in all 3 (100%) of the patients. Complications occurred in 2 of the 14 patients (immediate postoperative leakage and late small bowel obstruction in 1 patient, postoperative pneumonia in 1 patient) and one death from hypernatremia was observed.

**Conclusion:** Bariatric surgery is a promising treatment for weight reduction and can provide resolution of comorbidities in obese patients. Roux-en-Y gastric bypass is the predominant operation in this study.



### 9. Revision Surgery of Laparoscopic Adjustable Gastric Banding in Taiwan

Ju Juin Tsou Lee Wei-Jei

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**Objective:** Laparoscopic agjustable gastric banding (LAGB) is the safest bariatric surgery but revision surgery may be required. In this report, we present the experience of revision surgery of LAGB in Taiwan.

**Materials & Methods:** From January 2002 to December 2013, 272 conscutive patients with morbid obesity underwent LAGB in our department. Among them, 39 patiets (14.3%) received revision surgeries and were recruited in this study. The preoperative data of the surgical procedures and post-operative results were recorded and compared among different procedures.

**Results & Conclusion:** The most common cause of band removal or revision bariatric surgery was failed to lose adequate weight ( 28/39, 71.8% ), poor quality of life ( 5/39, 12.8% ), band slippage ( 4/39, 10.2%) and tube obstruction ( 2/39, 5.1% ). All procedures were performed laparoscopically with no conversion to open surgery. Among them, 6 had band removal and four patients had their bands still in place. Twenty-nine patients had revision to other bariatric procedures, 25 to bypass and 4 to sleeve gastrectomy. For the revision surgeries, two patients had leakage, one patient had post operative bleeding and two patients had post operative wound infection ( overall major complication rate is 7.7% ). Patients with revision surgeries had a decrease of BMI from  $39.6 \pm 6.7$  to  $29.5 \pm 3.5$  kg/m2. There was no difference in weight loss between bypass and sleeve gastrectomy. Conclusion: LAGB was a safe and effect weight reducing surgery. However, a late revision rate of 14.3% was observed with acceptable weight loss after conversion to another bariatric procedure.







### 10. Preliminary Results of Bariatric Surgery in Maharat Nakhon Ratchasima Hospital

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**Objective:** To study the preliminary results of Bariatric surgery in Maharat Nakhon Ratchasima Hospital.

**Background:** Over one billion individuals worldwide are considered overweight or obese which cause of increasing morbidity and mortality in these people. In Thai, one-third of people have BMI more than 25 Kg/m2 and 9% from these people have BMI more than 30 Kg/m2. Bariatric surgery has been shown the great results in sustainable weight loss with improvement in co-morbidities in these people.

Materials & Methods: We began the first 10 cases of bariatric surgery in May 2013 – February 2014, 8 cases were performed with laparoscopic sleeve gastrectomy (LSG). 1 case was performed with LRYGB. 1 case was performed with laparoscopic adjustable gastric banding (LAGB).

**Results:** Two diabetic patients can stop diabetic drug and one patient can reduce dosage of diabetic drug. Six hypertensive patients can reduce dosage of hypertensive drugs more than 50%.

**Conclusion:** Bariatric Surgery is safe and feasible in Maharat Nakhon Ratchasima Hospital. However, further studies with larger sample size and long term follow up are needed.



### 11. Outcome of Bariatric Surgery in Thailnd: Laparoscopic Gastrectomy vs Laparoscopic Roux-en-Y Gastric Bypass

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**Introduction:** Obesity becomes a public health problem in Asia. Bariatric surgery has been accepted as a effective treatment. Laparoscopic Roux-en-Y Gastric Bypass (LRYGB) is one of the most widely used procedures, but Laparoscopic Sleeve Gastrectomy (LSG) is increasing in popularity. However there is no study comparing both procedure in Thailand. Our objective is to evaluate the percentage of excess weight loss (%EWL), postoperative complication and mortality of the procedures.

**Methods:** A retrospective, group-matched controlled analysis was performed in 222 patients who underwent Bariatric Surgery at our institute by one surgeon between January 2003 and October 2013. The patients in each procedure were matched for body mass index (BMI). Outcome measures were percentage of excess weight loss (%EWL), postoperative complication and mortality.

**Results:** 80 patients performed either LSG or LRYGB with mean age 34.9 (9-60) years and mean BMI 51.9 (35.1-84.5). There were no operative-related mortality, no significant difference in postoperative complication (3.4% in LSG vs 6.4% in LRYGB, p=0.59). %EWL at 6 months of follow-up was analyzed. Overall %EWL was significant difference (41.1% in LSG vs 59.5% in LRYGB, p<0.01). Subgroup analysis of BMI was done. %EWL of LRYGB were superior than of LSG only in BMI 35-44.9 group (72.92% in LRYGB vs 47.98% in LSG, p<0.01). In BMI 45-59.9 group and super obese group (BMI >60), weight loss was significant after LRYGB and LSG but there was no statistic difference at 6 months of follow-up.

**Conclusion:** In Thai population, laparoscopic roux-en-y gastric bypass achieved a significant higher excess weight loss when compared to laparoscopic sleeve gastrectomy only in BMI <45. However both procedures result in success weight loss with comparable complication and no mortality in all BMI group.





### 12. Local Food Diet for Sustained Weight Loss After Bariatric Surgery in Malaysia

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**Background:** Metabolic surgery is fast becoming the mainstay of treatment for obesity. However, approximately 20-30% of post operative patients do not achieve satisfactory end weight outcomes. This study aims to show the effect of a specialized and personalized diet program on the end weight outcomes in reference to local dietary habits in Malaysia.

**Methods:** This is a cross-sectional study done in the Hospital Tuanku Ja'afar, Malaysia from the year 2012 – 2013. All patients who underwent laparoscopic sleeve gastrectomy were included into this study. End point measured were BMI, Excess Weight Loss (EWL), use of nutritional supplements, dietary regime and adherence to the dietary plans. Local food dietary regime was drawn out by our dieticians based on the patients' demographic background and lifestyle. All patients were followed up for 1 year.

**Results:** This study showed that 80% of post operative patients were adherent to the local food diet plan. Of this, 90% of those with good compliance showed a uniformed, controlled weight loss within the first 6 months post operatively.

Conclusion: Dietary regimes which are tailored to patients demographic and lifestyle circumstances are important to ensure compliance and ensure uniformly controlled weight loss post bariatric surgery.



### 13. Metabolic Outcomes of Bariatric Surgery "The Result of Thai Subjects

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**Introduction:** Obesity and its co-morbidities become to be one of the most important health care problems. Asian counties such as Thailand and other counties are not excluded. Weight loss surgery has been proved as the most effective and sustainable method to obtain long term weight control and to achieve improvement of metabolic disorders. We reviewed outcomes of surgical treatment for morbidly obese in Thai patients in our institute.

**Objective:** To review bariatric and metabolic outcomes of surgical treatment for morbidly obese in Thai patients in our institute.

**Methods:** Data from all patients who underwent bariatric surgery by Chula Minimally Invasive Surgery Center, Chulalongkorn University from Jan 2003 to May 2005 and July 2007 to August 2011 were collected and outcomes were reviewed.

**Results:** Metabolic result such as, DM, hypertension, hyperchloresterolemia also sleep apnea were improve after surgery. Patients resolve from diabetes mellitus were 81.8% and 18.2% others improve (decrease dose of insulin or medication). Resolving from hypertension was the same as improvement at 46.7% and 6.6% was not improve. Hypercholesterolemia resolved for 60% and 40% improved. Sleep apnea resolved for 52.9% and 47.1% improved

**Conclusion:** Metabolic results which are presenting in the early phase after bariatric surgery in Thai patients are excellent. Our initial data reflects a comparable result worldwide. Long term results are needed.



## 14. Compare of Laparoscopic Sleeve Gastrectomy and Roux-en-Y Gastric Bypass: Group-matched controlled study, Single institute in Thailand

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**Introduction:** Increasing of obesity patients is becoming a public health problem in Asia. Bariatric Surgery has been accepted as a effective treatment in Thailand. Laparoscopic Roux-en-Y gastric bypass (LRYGB) is one of the most widely used procedures, but laparoscopic sleeve gastrectomy (LSG) is increasing in popularity. However there is no study comparing both procedure in Thailand Our objective is to evaluate the percentage of excess weight loss, postoperative complication rate and mortality rate of the procedures

**Methods:** A retrospective, group-matched controlled analysis was performed on 156 patients who underwent LSG or LRYGB in a King Chulalongkorn memorial university hospital between 2003 and 2012. The patients in each group were matched for BMI. Outcome measures were percentage of excess weight loss (%EWL), postoperative complication and mortality.

**Results:** 78 patients performed either LRYGB or LSG with mean age 34.2 years, mean BMI 51.1 There were no operative related mortality, no significant difference in major complication rate (2.5% after LRYGB VS 1.26% after LSG). Overall %EWL was significant difference at 6 months and 12 months of follow up(6 months: 30.57% after LSG vs 50.05% after LRYGB,p > 0.001) and (1 years: 39.54 after LSG VS 64.75% after LRYGB,p >0.001). However in subgroup analysis shown statistic significant that LRYGB were superior than LSG only in BMI 35-44.9 and 45-59.9 but in super obese patients (BMI >60), Weight loss was significant after RYGB and LSG without any complication but there was no statistic difference between both groups at 6 and 12 months of follow-up. Conclusion: In thai populations, LRYGB patients achieved a significantly higher excess weight loss when compared to LSG except in super obese patients (BMI >60). However both procedures result in success weight loss with comparable complication and mortality rate in all BMI group.

**Discussion:** We found that acute weight loss may provide safety to perform LRYGB in super obese patient with same morbidity rate as lower BMI group. However further large number of patients and RCT study are required to compare result of both procedure.

#### 15 . Optimal BMI and Body Percent Fat Cut-Offs for Thai Adult

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**Introduction:** Body mass index (BMI) and body fat percentage (BF%) are generally used as measures of overall obesity.BMI provides the most useful population-level measure of obesity. It can be used to estimate the prevalence of obesity and the risk associated within population. Asian tend to have higher BF% than caucasian at the same BMI level. The aim of the study was to determine optimal BF% and BMI cut-offs for obesity to predict cardiovascular (CVD) risk factors (Hypertention, Dyslipidemia and type 2 DM) in Thai adult.

**Methods:** This cross-sectional study is comprised of 311 subjects (99 men and 212 women) from outpatients surgery unit and obesity clinic in Chulalongkorn hospital Bangkok Thailand. BF% was measured by using bioimpedance (Tanita 420). Participants were defined in 2 group by absent or present more than one CVD risk factors. Optimal BF% and BMI cut-offs were analyzed by receiver operating characteristic (ROC) curves. Logistic regression analysis was performed to measure the association between BF%, BMI and cardiovascular risk factors.

**Results:** The characteristics of the study population are presented in Table 1. Weight, BMI and BF% had statistical significant difference between CVD risk and no CVD risk group (p<0.001). The CVD risk factors positive group had BMI higher than the CVD risk factors negative group (36.75 vs 28.95 kg/m). The optimal BMI cut-offs for the prediction of the CVD risk was 33kg/m (The odds ratios(OR) was 8.56, 95% confidence intervals (CI) 4.63-15.82, p<0.0001). Area under ROC curve (AUC) was 75% (Figure 1). The optimal BF% cut-offs for the prediction of CVD risk was 30%(OR were 10.88, 95% CI 2.80-42.27, p<0.0001) for men (Figure 2) and 47%(OR 5.17, 95% CI 2.15-12.30, p<0.0001) for women (Figure 3). AUCs were 73% and 72%, respectively.

**Conclusion:** The optimal BMI and BF% cut-offs for obesity to prediction of CVD risk in Thai adults were 33kg/m, 30%in men and 47% in women, respectively. The cut off points for obesity could be different for different populations. Further investigation and increasing amount of subjects should be perform in future.





#### **THAILAND**

With over 20 million visitors each year, Thailand the "Land of Smile", is one of the most fascinating and vibrant destinations in the world. A land of golden temples and stunning beaches, Thailand's strategic location within the Asia Pacific region combined with its geographic, social and cultural diversity make for an exceptional travel experience that you won't soon forgot.

Thailand, formerly known as the Kingdom of Siam, is democratic nation. King Bhumibol of the Chakkri Dynasty is the revered symbolic head of the country. Thai is the main language spoken throughout Thailand, however, English is widely understood and spoken in major cities.

Population of Thailand is approximately 65 million people and is made up of Thai (80%), Chinese (10%), Malay and several other minorities (Laos, Mons, Khmers and Hill Tribes)

There is enormous cultural and social unity, which is reflected in the thais' respect for other people, their gentle nature and warm hospitality.

#### BANGKOK

Bangkok, The "City of angels", is a city full of temples and palaces, golden spires, orange-tired roof and images of Buddha. With a population of 7.6 million covering an area of 1,569 sq km Bangkok is the Capital of Thailand.

Bangkok is located on the east side of the Chao Phraya, "The River of Kings" and natural and artificial canals crisscross the city. The blend of the old and new, traditional and modern, make this city on of the most interesting in the world.

Bangkok has enough tourist sites to make it a highlight of you trip to Thailand, Don't expect to see it with a thistle-stop tour then quickly move on to somewhere else, believing Bangkok is nothing more than traffic congestion and high-rise buildings.

With the right Bangkok tourist info, you can find many captivating sights; including ornate temples, vibrant traditional Thai markets, and a surprising number of quiet oases in which you can while away a few hours.

Bangkok is also a shopper's paradise, with countless options for shopping, ranging from top-of-the-range designer goods, through to small hand-made mementos which you can haggle for at any of Bangkok's many markets. Tourists in Bangkok will be impressed at how much the city is geared up for them.



#### KRABI

Krabi is a southern province on Thailand's Andaman seaboard with perhaps the country's oldest history of continued settlement. After dating stone tools, ancient colored pictures, beads, pottery and skeletal remains found in the province's many cliffs and caves, it is thought that Krabi has been home to Homo Sapiens since the period 25,000 - 35,000 B.C. In recorded times it was called the 'Ban Thai Samor', and was one of twelve towns that used, before people were widely literate, the monkey for their standard. At that time, c. 1200 A.D., Krabi was tributary to the Kingdom of Ligor, a city on the Kra Peninsula's east coast better known today as Nakhon Si Thammarat.

Much of the province has been the seat of several national parks. The topmost destinations are Hat Noppharat Thara, Ao Nang, Railay, Ko Phi Phi National Park. Yet over 80 smaller islands such as Lanta islands, or Koh Lanta, Phi Phi islands - made famous as the ideal location for adventurers, yachtsmen, scuba-divers, snorkelers and day-trippers from Phuket.

Krabi is growing fast, in the last few years Tesco, HomePro, Big C have all opened and a new International hospital is in the final stages of construction. Krabi has a reputation of being a true Thai countryside location and with the now enlarged Krabi International airport is seen as the ideal balance between convenience and lifestyle. People are being drawn to Krabi in search of the idyllic beach life that Phuket and Koh Samui offered a decade ago but are in danger of losing as they get bigger.

International residents are catered for, although on a smaller scale than Phuket, with regard to immigration services and English speaking staff in local government offices. Entertainment options are on the increase as are true International standard Hotels and attractions. To cater for the inward surge of potential residents, many real estate companies have emerged building high quality villas and homes specifically for foreigners.

The Ko Lanta National Park, also in Krabi province, includes several coral-fringed islands with well-known diving sites. The largest island, Ko Lanta Yai, is the site of park

headquarters, and is also home to Chao Le, or sea gypsies who sustain themselves largely through fishing. The islands are best visited during the non-monsoon months of October through April.

Kayaking, sailing, birdwatching, snorkeling are also among top activities. In the interior, two predominantly mainland national parks, Khao Phanom Bencha and Than Bokk-horani, offer inland scenic attractions including waterfalls and caves, and opportunities for trekking, birdwatching and eco-tours.

The rock faces at Railay Beach near Aonang have attracted climbers from all over the world and each year are the venue for the Rock and Fire Festival. There are several Rock Climbing schools at Railay beach.



#### Language

The official language of the Congress is English

#### • Congress Documents and Badges

The Congress documents must be collected on-site at the registration desk. Name badge must be worn at all time at the congress and in the exhibition area.

#### • Certificate of Attendance

A certificate of attendance will be included in the congress Bag.

#### Invitation letter

Upon request, the Congress Secretariat will be happy to issue an official letter of invitation to attend the Congress. Letters of invitation are intended to help participants in raising travel funds, obtaining visas or permission from their institutions to attend the Congress and this does not include or imply payment by APMBSS2014 Organizing Committee of any expenses, such as registration fee, travel or hotel accommodation.

#### Passport & Visa

All Foreign visitors entering Thailand must have a passport, which is valid for at least 6 months. The Thai government allows 45 different nationalities to enter the country for 30 days without visa. Participants from countries whose citizens required to have visa should apply to the Thai consular office or diplomatic mission in their countries at least 6 weeks before departure. Participants are advised to contact their local travel agents or air carrier for details.

#### • Official Carrier

Thai Airways International (TG) has been appointed as the official carrier for this Congress Please contact your nearest Thai International office for your reservation. For the congress participants, contact the official organizer who offer the special rates, Please contact direct to the organizer office Annaluxx Co., Ltd at +66(2) 2662900 email: contact@apmbss2014.com

#### Official Travel Agent

Annaluxx Co., Ltd. has been appointed as the official travel agent for this congress. Please contact:

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#### Insurance

Participants are requested to make their own arrangement with respect to health and travel insurance.

#### • Program Change

The Organizer cannot assume liability for any change in the program due to the external or unforeseen circumstances.

#### • Travel's Cheques and Credit Card

Major credit cards, such as Visa and Mastercard are acceptable in hotels and shops, Traveler's Cheques can be conveniently cashed at all commercial banks and authorized money changer.

#### Currency

Only Thai Baht is acceptable at stores and restaurant. Foreign currency exchange service are available at major banks and hotels. Banking hours are from 0830 -1530 hours from Monday to Friday.

#### Electricity

Voltage in Thailand is 200V AC using two-pin sockets.

#### Temperatures

Being the South East Asia region, Thailand have a subtropical climate. During march the temperature averages 32-35 °C in the daytime and 25-30 °C at night

#### • Time Difference

Thailand time is GMT plus 7 hours.



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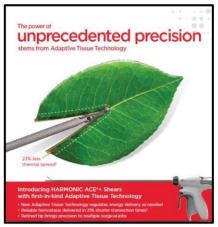


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#### Who We Are

### COVIDIEN THAILAND FACTS

Employees = 809 Commerical = 125 Manufacturing = 684

#### **LOCATIONS**

- Bangkok commercial operations established in 1998 currently with an office of 1,725 sqm.
- Nakorn Prathom manufacturing plant acquired in 1988 developed on 57,870 sqm of land with 7,876 sqm built up area.

#### **GLOBAL FACTS**

Employees = 38,000Countries = 70

#### **COVIDIEN 2020 VISION**

Deliver unmatched value to our customers by providing innovative solutions that improve patient outcomes, lower the cost of healthcare delivery and expand global access to care.

#### PROVIDING HEALTHCARE SOLUTIONS FOR:

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- Physician offices
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Covidien is a leading global healthcare products company that creates innovative medical solutions for better patient outcomes and delivers value through clinical leadership and excellence. With 2012 revenue of \$9.9 billion, Covidien has 38,000 employees in 70 countries, and its products are sold in over 140 countries.

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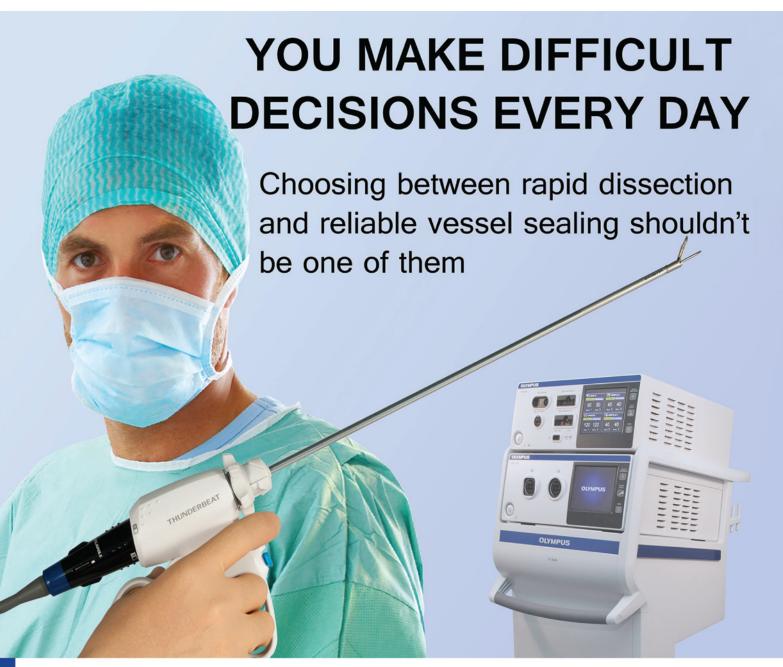
- Neurovascular Products
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- Nursing Care



For more information please contact our staff Tel: 662-207-3100

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