Initial Experience and Result of a Swedish Adjustable Gastric Banding by Laparoscopic Approach in Thai Cohorts

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Background: *Morbid obesity is a growing problem in Thailand. Several surgical procedures are available for weight reduction. The laparoscopic gastric banding has been shown to be an effective weight loss with a low post or perioperative complication.*
Objective: *The aim of this report was to evaluate the early preliminary outcome of the laparoscopic Swedish adjustable gastric banding operation in Thai cohort patients.*
Material and Method: *From November 2003 until March 2005, ten patients with a median age of 31 (range, 18-61) underwent laparoscopic Swedish adjustable gastric banding for morbid obesity at Ramathibodi Hospital. Demography, clinical course and outcome including excess weight loss and peri-operative complications were reviewed and studied. Descriptive statistics were used for data summary.*
Results: *There were 3 men and 7 women with a median preoperative body weight of 142.5 kg (range, 98-164 kg), and median body mass index (BMI) of 49.2 kg/m^2 (range, 40.3-62.4 kg/m^2). The operations were successful in 9 out of 10 patients with median operative time of 195 minutes (range, 125-275 minutes). One patient with a BMI of 62.4 had a failed operation due to poor operative exposure from a very large left lobe of the liver. None of the remaining patients required conversion to the opened technique. The mean hospital stay was 4 days with no perioperative mortality. There was no major post operative complication except one minor wound infection. The excess weight loss was within the range of 33.5% to 62.1% during the short-term follow-up (range, 1-15months)*
Conclusion: *The presented early preliminary result of the laparoscopic Swedish adjustable gastric banding showed a good technical success with a significant short-term weight loss. The authors believe this minimally invasive operation is appropriate for morbidly obese Thai patient. However, a longer follow-up study is needed.*

Keywords: *Laparoscopic gastric banding, Morbid obesity, Surgical complication, Surgical device, Weight loss*

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Morbid obesity carries a major health hazard and reduces the quality of life and life expectancy because of its associated pulmonary, vascular, endocrine, and skeleton complications[1]. Obesity is one of the most common chronic illnesses in the Western world with the prevalence around 10-15%. In Thailand, the demographic study showed a recent increase in the prevalence of obesity, especially among youths[2,3], because of the change in our nutritional behavior. Like the Western world, obesity will become a major public health concern in the near future. Various treatments have been used with mixed results. The standard conservative treatment such as dietary method achieves a short-term result but does not sustain a meaningful

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weight loss in these individuals[4]. Hence, surgical intervention is increasingly considered as an option in the treatment of morbid obesity. Two different types of surgical procedure are available based on different mechanism. One type bases the mechanism on creating a mal-absorption situation i.e., an intestinal bypass, and the second type bases on a stomach volume restriction by constructing a restrictive proximal gastric pouch that prevents massive food intake and generates the perception of early satiety. The latter category was frequently performed and was first described by Mason et al as a Vertical Banded Gastroplasty (VBG)[5]. The calibrated VBG represents an acceptable compromise between long lasting efficacy and low morbidity[6]. On the same basis, the adjustable gastric banding produces similar results in terms of weight loss with a lower risk of life-threatening complications because there was no entering or anastomosing of the digestive tract. Laparoscopic adjustable Gastric Banding (LGB), which was introduced in the early 1990s, offers the advantages of minimally invasive surgery, adjustability, and reversibility. This procedure involves the use of an adjustable silicone band placed around the gastric cardia and creates a small 15-ml gastric pouch with a narrow outlet (Fig. 1), a similar concept to that of the VBG. The two most common commercially available products are the Lap Band (Bioenterics, Carpinteria, California, USA), and the Swedish Band (OBECH, Zug, Switzerland). The laparoscopic approach has brought several advantages in terms of safety and comfort. The aim of this study was to report the preliminary result of the authors' initial experience with Swedish LGB in morbidly obese Thai patients.

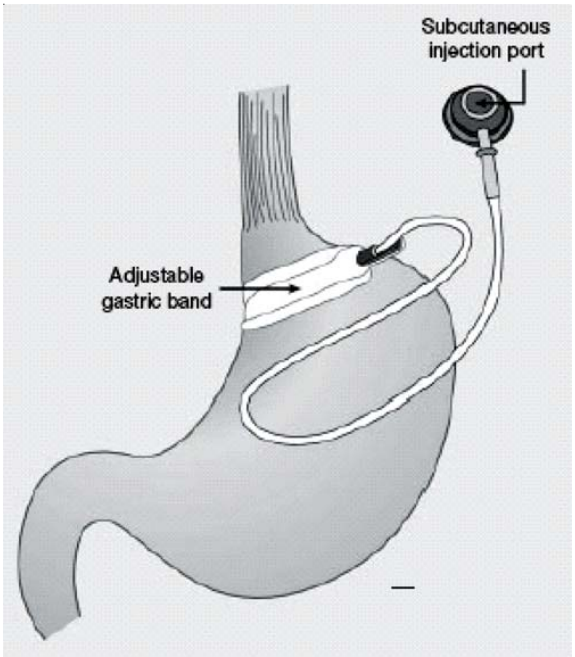

Fig. 1 Adjustable gastric banding

Material and Method

From November 2003 to February 2005, 10 consecutive morbidly obese Thai patients underwent the LGB procedure at Ramathibodi Hospital, Mahidol University. All patients were carefully screened and selected according to the criteria for bariatric surgery as defined by the NIH Consensus Development Panel report in 1991[7]. The excess weight was defined as the difference between the patient's actual weight and the theoretical medium-frame ideal body weight as defined by the Metropolitan Life Insurance Company's 1983 height/weight tables.

Preoperative evaluation and management

All patients underwent extensive preoperative evaluation including history, physical examination, and nutritional and psychitric evaluation by a multidisciplinary team approach involving a nutritionist, a dietitian, an endocrinologist, a psychologist, an anesthesiologist, and a surgeon. No patients were operated on, based on the surgeon's decision alone. The patients were usually referred by the hospital's nutritionist or endocrinologist after failed conservative treatments during the past 3 years. No patients had undergone any attempts at surgical treatment for their morbid obesity. During the first visit, detailed information was provided in both verbal and written form regarding the surgical procedure, its associated risks and benefits, any possible side effects, and the overall success rate. Post-operative dietary restriction regimen and a full total compliance were thoroughly discussed in detail with the patient, including an intensive post-operative follow-up.

Operative management

All patients received perioperative low molecular weight heparin for deep venous thrombosis prophylaxis. The technique the authors used was a five-trocar approach, using two 5-mm ports, one 15-mm port, one Visiport (12-mm), and a Nathanson liver retractor for lifting up the left lobe of the liver. This technique is also known as the 'pars flaccida technique' with some modification as described by Belachew M. et al[8]. There are several key points for consideration; 1) all patients

should be placed in a reversed Trendelenburg position to an approximately 45° angle, 2) the path prepared for the band placement must be immediately below the esophagogastric junction with the dissection carried out close to the angle, just proximal to the first short gastric vessels. No vessels should be cut. Only the vascular suspensatory ligament of the fundus was opened to create the space between the esophagus and the left crus of the diaphragm. The authors always use the goldfinger to create a retrogastric tunnel and to pull the band into this tunnel before locking the band. Third, the authors do not use the intraluminal balloon for proximal gastric pouch calibration. This pouch volume is estimated during the making of the anterior gastro-gastric seromuscular stitches to cover the anterior part of the band.

Post operative care and band adjustment

The patient was started on a clear liquid diet on the first postoperative day. The following morning, a contrast swallowing study was performed to confirm the position of the band and the size of the pouch. The patient would be normally discharged within the next two days; and prior to discharge and with the help from the dietitian, the patient was placed on a strict diet regimen that consisted of a liquid diet for four weeks, followed by a pur e diet for another two weeks, and finally a blended regular solid food. The patient would then be followed up regularly every 6 weeks for the first post operative year and then for every four months thereafter. The band was injected with a 4-ml normal saline during the first follow-up visit. An additional injection was made only if the weight reduction goal of 0.5-1 kg/week was not attainable. The authors never injected more than 9 ml of normal saline. The median volume for injection was 6 ml (range 0-9 ml) because an overfilling of the band can lead to either a dysphagia or too fast of a weight loss. The authors then routinely repeated another barium swallow after a 6-month period.

Results

There were 7 women and 3 men with the median age of 31 years (range, 18-62). The preoperative median body weight was 142.5 kg (range, 98-164 kg) and the median preoperative Body Mass Index (BMI) was 49.2 (range, 40.3-62.4 kg/m^2). Four patients were super obese (BMI > 50) with two of them having severe obstructive sleep apnea requiring a nasal CPAP during their sleep. The operation was successful in 9 out of 10 patients with a median operative time of 195 minutes (range, 125-275 minutes). The biggest patient, with a BMI of 62.4, failed to complete the operation due to the poor operative exposure from a very large left lobe of the liver. The procedure was then early terminated for the patient's safety. This patient is planned to do the operation again after the authors' team obtain the super-large Nathanson liver retractor. None of the remaining nine required an open conversion. There were no perioperative complications. The median hospital stay was 4 days (range, 3-6 days). Table 1 provides the summary of the patients initial body weight, the BMI, the length of follow-up, and the amount of excess weight loss. Out of the three super obese patients that completed the operation, one had a complete cure of her sleep apnea, while the remaining two showed signs of improvement. There was no operative mortality and none suffered significant complication. One patient developed minor port site wound infection. All other complications such as band slippage, pouch dilatation and even reflux symptom have not been so far detected. No patient required a reoperation and all had a normal 6-month barium swallow study.

Table1. Weight losses during 1-15 -months follow-up of 10 cases

No.	Sex	Age	Wt (kg)	Ht (M)	BMI	Follow-up (mo)	Wt loss	BMI
1	M	47	137	1.65	49.2	15	118	43.5
2	M	33	158	1.81	48.3	14	103	33.3
3	M	25	164	1.74	54.3	12	118	39.1
4	F	27	157	1.60	61.3	11.5	119	48.4
5	F	31	132	1.64	49.1	9	118	44.0
6	F	18	98	1.56	40.3	7.5	89	36.6
7	F	31	108	1.61	41.7	6	83	32.4
8	F	62	148	1.54	62.4	Fail →		
9	F	51	122	1.65	44.8	2	115.5	42.4
10	F	23	140	1.67	50.2	1	124	44.4

Discussion

Since the first jejuno-ileal bypass performed by Kremer and Linner in the 1960s, various surgical approaches have been developed in an attempt to tackle the problem of obesity. Malabsorptive procedures, such as jejuno-ileal, biliopancreatic, or gastric bypass allow the patient to 'lose weight' while eating 'normally'. Although considerable weight loss can be achieved by the bypass operation, the cost of the anastomosis disruption and the potentially serious nutritional deficiencies may sometimes outweigh its benefits. While the jejuno-ileal bypass procedure is no longer performed because of its high mortality and morbidity rate[9], the Roux-en-Y gastric bypass is quite popular and considered the gold standard operation in many places in the US. Combining the procedure with the laparoscopic technique, the procedure can now achieve a significant result with a low overall rate of 3.3% major, and 27% minor complications and still achieve excellent overall weight loss of at least 60% EBW[10]. However, this procedure is difficult and has a steep learning curve, not to mention its lengthy operation of 2 to 3 times longer than the gastric banding. The complications of anastomotic failure and intestinal obstruction can be potentially lethal. In contrast, a restrictive procedure that includes a small pouch and a slow gastric emptying outlet limits the amount of total food intake and creates the sensation of early satiety. It results in a 40% to 50% excess weight reduction in 1 to 2 years[11]. VBG introduced by Mason[12] in 1980, is one of the prototype procedures. It is often associated with less than 1% mortality rate and avoids the potential of lifelong risk of malnutrition seen in the gastro-intestinal bypass. However, the problems of the fixed outlet size, the subsequent pouch dilatation, and the stapler line failures can often lead to a high incidence of uncontrolled gastrooesophageal reflux and inadequate overall weight reduction. An AGB device, introduced by Kuzmak[13], provides the solution and has been adopted and widely used throughout Europe, Australia, and the USA. The proposed advantages of AGB include the simplicity, reversibility, adjustability of the band's stoma size, and overall comparability result to that of the VBG. A small randomized controlled trial comparing the opened VBG with that of the opened AGB demonstrated a comparable amount of weight loss, but VBG suffered a higher re-operation rate due to too late stricture at the stoma outlet with a result stapler lines disruption[14]. The advantage of the laparoscopy when combined with AGB (LAGB) was demonstrated further[15]. Despite a 15-year experience of VBG compared with only a 3-year of LAGB, both procedures showed similar weight losses after 2 years, but LAGB enjoyed the advantages of much lower postoperative morbidities (8.0% vs 23.8%) and shorter hospital stay. The design of the band and its adjustability helps avoid the late becoming stricture of the stoma outlet and often the stapler line disruption seen in VBG. This advantage helps keep the weight loss and avoid reoperation.

This is the first case series report in Thailand of a growing popular procedure observed in several international studies[14-21]. The approach or the technique is also known as the pars flaccida, defined by limiting the dissection of the mesenteries of the stomach[21]. This technique achieves an adequate posterior fixation of the band. It is easy to perform and has resulted in minimal to no postoperative complications. The anterior aspect of the band is fixed by a suture placement. Presently, the LGB may be regarded as the least surgery involvement of all the choices of bariatric procedures. Another additional advantage of the LGB is the fact that it can be changed to another weight loosing operation if the LGB fails for whatever reasons. Malabsorptive operations such as gastric bypass procedure certainly give a better overall long-term result but have greater short-term risk and complications, especially if being done by minimally invasive technique[22-25]. Therefore, in the authors' opinion, LGB is quite suitable as the first bariatric surgery of choice for those morbidly obese patients. The authors' preliminary result shows a fairly good short-term outcome comparable to other studies in terms of excessive weight loss. The median BMI went down from 49.2 to 40.7 at a 6-month and 1-year follow-up. The overall median excessive weight loss was 47.4%. It has been suggested that the outcome of LGB operations for the super morbidly obese (BMI > 50) may be less optimal, but the present result suggested otherwise. Although small in number the outcome of the three super morbidly obese enjoy an equal or better outcome compared to those with a BMI of less than 50. Three patients with some degree of sleep apnea syndrome noticed a significant improvement and the quality of life with one who was able to completely come off the CPAP machine at night after just a 25 kg of weight loss. The other two patients with mild OSAS no longer required the use of continuous positive airway pressure.

Conclusion

The authors' early experience with the Lap-Swedish band system shows a good result for the morbidly Thai obese. The laparoscopic approach offers

the advantage of simplicity, early patient mobilization, a shorter hospital stay with early return to work, and a fewer wound complications. It enjoyed at least a 33.5% excess weight loss after a 1-year follow-up. The sustained long-term weight loss and any future risks or complications however awaits a longer follow-up study. Interestingly, the most common observed complication of the LGB is the band slippage. This incidence is now decreasing since the emergence of the par flaccida approach.

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ประสบการณ์เบื้องต้นและผลการผ่าตัดโดยใช้กล้องใส่ยางรัดกระเพาะชนิดสวีดิชในผู้ป่วยโรคอ้วนไทย

ธีรพล อังกูลภักดีกุล, ปรีดา สัมฤทธิ์ประดิษฐ์, ดรุณีวัลย์ วโรดมวิจิต, จุฬาภรณ์ รุงค์พิสุทธิ์พงษ์, ไพศาล พงษ์ไชยเลิศ, สุรัตน์ โคมินทร์

ปัจจุบันนี้โรคอ้วนกำลังเป็นปัญหาคุกคามต่อสุขภาพคนไทยมากขึ้น การผ่าตัดเพื่อลดความอ้วนมีหลายชนิด การผ่าตัดผ่านกล้องใส่ยางซิลิโคนไปรัดกระเพาะอาหารเป็นการผ่าตัดชนิดหนึ่งที่พบว่าสามารถลดน้ำหนักผู้ป่วยได้ดี และมีปัญหาภาวะแทรกซ้อนระหว่างผ่าตัดและหลังผ่าตัดน้อย การศึกษานี้มีจุดประสงค์เพื่อประเมินวิเคราะห์ผลของการผ่าตัดใส่ยางซิลิโคนชนิดสวีดิชในผู้ป่วยโรคอ้วนไทยในระยะเบื้องต้น โดยเป็นการศึกษาเก็บข้อมูลระหว่างเดือนพฤศจิกายน พ.ศ. 2546 ถึง มีนาคม พ.ศ. 2548 ในผู้ป่วยทั้งหมด 10 รายติดต่อกันที่ได้รับการผ่าตัดในโรงพยาบาลรามาธิบดี โดยนำข้อมูลทั้งหมดของผู้ป่วย, ผลในทางคลินิกที่รวมทั้งปริมาณน้ำหนักเกินที่ลดลงและภาวะแทรกซ้อนในระหว่างและหลังผ่าตัดมาศึกษา ผู้ป่วยทั้งหมด 10 ราย เป็นเพศชาย 3 ราย เพศหญิง 7 ราย มีน้ำหนักเฉลี่ย 142.5 กิโลกรัม (พิสัย 98-164 กิโลกรัม) ค่าดัชนีมวลกายเฉลี่ย 49.2 กิโลกรัม/ตารางเมตร (พิสัย 40.3-62.4 กิโลกรัม/ตารางเมตร) สามารถทำผ่าตัดสำเร็จ 9 คน ผู้ป่วย 1 คนที่ได้รับการผ่าตัดไม่สำเร็จเนื่องจากขนาดของตับข้างซ้ายใหญ่มากและปิดบังบริเวณผ่าตัดจึงได้ยุติการผ่าตัดโดยที่ผู้ป่วยไม่มีภาวะแทรกซ้อนผู้ป่วยรายนี้มีดัชนีมวลกาย 62.4 กิโลกรัม/ตารางเมตร ระยะเวลาในการผ่าตัดเฉลี่ย 195 นาที (พิสัย 125-275 นาที) ระยะเวลาในการนอนโรงพยาบาลมีค่ามัธยฐาน 4 วัน ผู้ป่วยทั้งหมดไม่มีภาวะแทรกซ้อนระหว่างผ่าตัด มีผู้ป่วยหนึ่งรายมีแผลอักเสบติดเชื้อ ผู้ป่วยทั้งหมดหลังติดตามระหว่าง 1-15 เดือน มีเปอร์เซ็นต์ของน้ำหนักเกินลดลง 33.5-62.1% การผ่าตัดใส่ยางซิลิโคนชนิดสวีดิชในผู้ป่วยไทยแสดงให้เห็นถึงความสำเร็จในการทำผ่าตัดและมีผลลดน้ำหนักผู้ป่วยได้ดีถึงแม้เป็นการศึกษาระยะสั้นหลังผ่าตัด คณะผู้วิจัยเชื่อว่าการผ่าตัดชนิดนี้เหมาะสมเป็นการผ่าตัดเบื้องต้นในการลดน้ำหนักของผู้ป่วยโรคอ้วนคนไทย อย่างไรก็ตามควรมีการศึกษาวิจัยประเมินผลในระยะยาวต่อไปด้วย