

## Modern Surgery: Technical Innovation

# Perioperative Comparison of the *MiniMizer*<sup>®</sup> Extra Band with the Other Laparoscopic Gastric Bands

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**Background:** Laparoscopic adjustable gastric banding is a widely used operation for morbid obesity. The most frequent complications of this operation are band migration and pouch dilatation (slippage). The use of the newly introduced *MiniMizer*<sup>®</sup> Extra band with a unique gastric wall fixation system and a two-degree closure may decrease the postoperative complication rate. Very early (perioperative) results are hereby reported.

**Methods:** From February 2005 through October 2005, 50 classical bands (Obtech-Ethicon, AMI, Midband, Inamed) and 10 *MiniMizer*<sup>®</sup> Extra bands were inserted in our department. Bands were chosen randomly. Complications in the very early postoperative period were studied.

**Results:** No statistically significant differences between surgery times were noted – classical bands mean 36 min (20-60), and *MiniMizer*<sup>®</sup> Extra bands mean 34 min (25-55). No statistically different rates of perioperative complications were noted, with only 2 very minor intraoperative complications in the entire series.

**Conclusions:** The absence of problems in the perioperative period allows the use of the *MiniMizer*<sup>®</sup> Extra band as an alternative to classical bands for short- and long-term comparison.

**Key words:** Morbid obesity, laparoscopic gastric banding, complications, device, *MiniMizer*<sup>®</sup> Extra

## Introduction

Obesity is a major health-care problem, especially in developed countries. In the USA, overweight and obesity are present in 66% of the population, and

one-half of this group is obese (BMI >30).<sup>1</sup> In the Pol-MONICA Programme (which estimated risk factors for cardiovascular disease in the Polish population), overweight was found in 45.3% of men and in 35.1% of women, while obesity affected 22.4% of males and 29% of females.<sup>2,3</sup>

Adjustable gastric bands are one of the methods for surgical treatment of morbid obesity (BMI >40 or >35 with co-morbidities). This method, introduced by Kuzmak in 1985 (Adjustable Silicone Gastric Banding)<sup>4</sup> and Hallberg (Swedish Adjustable Gastric Banding),<sup>5</sup> has been performed laparoscopically since 1993 (Belachew),<sup>6</sup> and interferes minimally with the gastrointestinal tract and has a low incidence of complications. This operation is popular in a number of bariatric surgery centers,<sup>7</sup> and in Australia, it has been recommended as the method of choice.<sup>8</sup> It is estimated that it represents 30% of bariatric operations performed worldwide.<sup>7</sup>

This study aimed at comparing “classical” gastric bands (Obtech-Ethicon, Midband, AMI, Inamed) with the *MiniMizer*<sup>®</sup> band manufactured by HospiMedical.<sup>9</sup>

## Materials and Methods

During the period February to October 2005, 50 traditional and 10 *MiniMizer*<sup>®</sup> Extra (HospiMedical GmbH, Meerbusch, Germany) gastric bands were applied at the Clinic of General and Gastroenterological Surgery, Medical University of

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Lodz. The traditional bands included products of: Obtech-Ethicon – 19 (38%), AMI – 11 (22%), Midband – 12 (24%), and Inamed – 8 (16%) including 3 VanGuard bands. The type of band was randomized.

The traditional bands were installed in 31 women (62%) and 19 men (38%). The mean age of female patients was 38 years (17-59) and of male patients was 45.4 years (28-60). The mean BMI was 45 in women (37-56) and 50 in men (38-66).

MiniMizer® Extra bands were applied in 7 women and 3 men. The mean age among the female patients was 36 years (29-45) and in the male patients 44.3 (38-53). The mean BMI was 43 in women (38-44) and 43.3 (42-45) in men.

The patients were qualified for surgery by a team consisting of a surgeon, a gastrologist-endoscopist, an endocrinologist, a psychologist, an anesthesiologist, and a dietician. The weight reduction operation was performed for the first time in all the patients, following failure of conservative therapy. The standard pars flaccida technique was applied,<sup>10</sup> using four trocars: a 30°-10-mm camera, a hepatic retractor – 5 mm, and two working trocars – 10 and 20 mm (the 20-mm trocar was used for the band insertion). The bands of Inamed, Midband and HospiMedical were pulled from the tubing end behind the stomach, while the Obtech-Ethicon and AMI bands were pulled from the band end. Plication (complete anterior fixation by gastro-gastric stitches over the band) was used for the Inamed, Obtech-Ethicon, AMI and Midband bands, applying three or four non-absorbable interrupted seromuscular sutures (Sofsilik 0) (Figure 1). The same suture material was used for seromuscular suturing of the retaining loops on the MiniMizer® Extra bands (Figure 2).

The access-port was implanted directly under the skin in the midline below the xiphoid process, without suture stabilization, and was attached to the tubing from the band. Neither the peritoneum nor the subcutaneous tissue was sutured. Single intradermal sutures were applied. Antithrombotic prophylaxis was administered in all the patients, including 0.3 ml of Fraxiparine on the day of operation, followed by a similar dose on the first day after the surgery. The patients also received antibiotic prophylaxis as one dose of Kefzol®. Results of the studies were submitted to statistical analysis by the *Statistica 6.0 for MS Windows* software package.

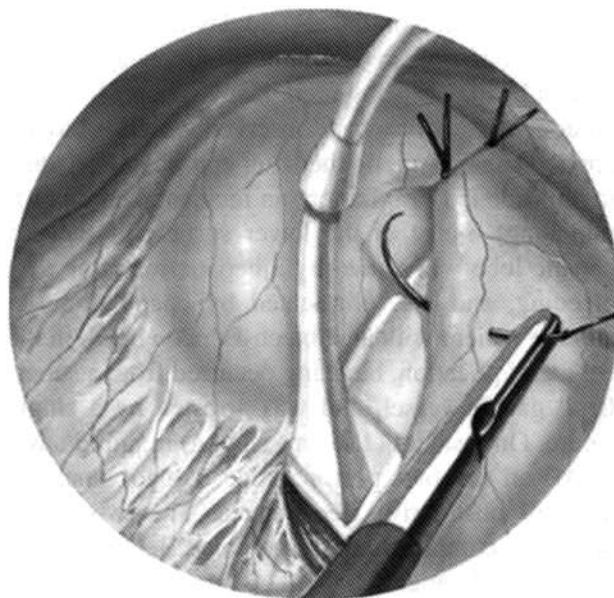


Figure 1. "Classical" band fixation to the gastric wall.

## Results

In the group of patients with traditional bands, the mean duration of the operation was 36 minutes (20-60). In the group in which MiniMizer® Extra bands were installed, the operation lasted 34 minutes (25-55). On analysis of age and degree of obesity in the operated patients, no statistically significant difference was found between the groups. All patients stayed on the postoperative ward for 1 day, and were

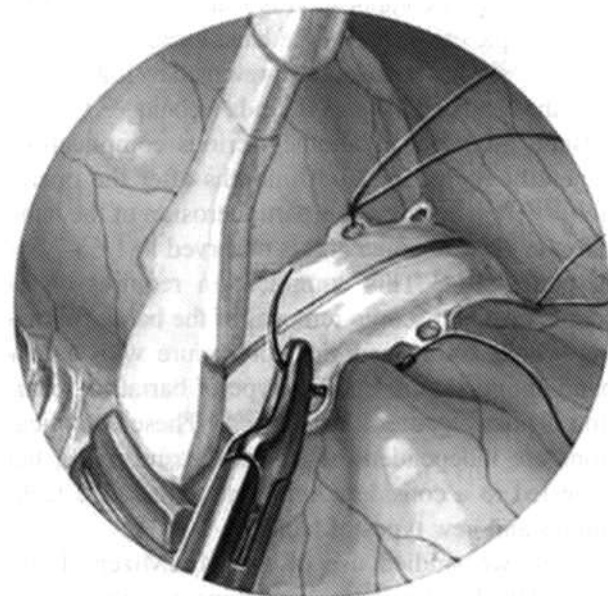


Figure 2. MiniMizer® band fixation to the gastric wall via eyelets.

discharged home on the second day after the operation. No intraoperative complications, related to the type of band, were observed in any group. However, other complications were observed, unrelated to the applied bands. Among the latter complications, during a Midband installation, an incidental small (10-mm long) injury of the lower surface of the left hepatic lobe was made by a hepatic retractor with bleeding, and was eliminated by coagulation. In another patient with an Obtech-Ethicon band, in the course of plication, bleeding occurred from a superficial gastric vessel, and was arrested by a single suture. One patient (186 cm, 204 kg) required nasal CPAP on the first postoperative day for management of obstructive sleep apnea. The two minor operative complications represented 3.33% among the operated patients.

## Discussion

Among the more than 150,000 patients in the world<sup>10</sup> who have received gastric bands, band slippage and band migration have been the most common serious late complications, occurring generally 3-4 years after the operation.<sup>11-14</sup> Band slippage (incidence 0.5% to 21%) consists of anterior or posterior slippage of the gastric wall above the band, which increases the volume of the proximal pouch and potentially obstructs the outlet.<sup>15-18</sup> This complication is usually eliminated by laparoscopic correction of the band location or gastric bypass.<sup>19,20</sup> It has been largely prevented by imbrication over the band and the pars flaccida technique.<sup>8,14,21</sup>

Band migration is another serious complication, generally occurring 10-40 months after the operation.<sup>14,22,23</sup> It consists in a partial erosion of the band into the gastric lumen and is observed in 1.66-7.5% of patients.<sup>24,25</sup> This complication requires endoscopic or laparoscopic removal of the band, following which another surgical procedure with a new band application or another type of bariatric operation is possible after 2 months.<sup>26-28</sup> These complications are independent of available band types, but have led to a consideration of new operative techniques and new types of bands.

Thus, we studied use of the MiniMizer<sup>®</sup> Extra band. This band is unique in having a series of very elastic retaining-loops or hooks by which it can be

secured to the gastric wall against dislocation (Figure 3). Following the manufacturer's recommendation, the band is fixed with non-absorbable suture. Thus, band stabilization at a specific height is possible. This procedure allows for free shaping of the gastric pouch volume. In the area not available to suturing (the posterior gastric wall), fibroblasts grow through the band's holes, fixing it at the site. This technique does not require imbrication and folding of the anterior gastric wall.

Moreover, the MiniMizer<sup>®</sup> band has an additional mechanism, allowing its adjustment to the diameter of the gastric wall and to the pre-gastric fat, which is possible because of a two-phase system of band locking, using a closure tool provided by the manufacturer. In this way, the circumference of the band is either 11 or 10 cm (Figures 4A and 4B). Until now, only Inamed has offered bands of different circumferences; however, prior to implantation surgery, two different bands were to be at hand, because it was impossible to foresee the correct size for the patient before the operation.<sup>27,29</sup>

The mechanism of the MiniMizer<sup>®</sup> Extra band enables lower volumes of fluid to be instilled into the band and prevents its migration. However, comparing patients in both groups regarding the time aspect of the operation, the number of intra- and perioperative complications, the period of stay on the postoperative ward and the total length of hospitalization, no significant differences were observed between the bands. Gastric banding, considering its minimal interference with the anatomy of the gastrointestinal tract and easy performance for a sur-

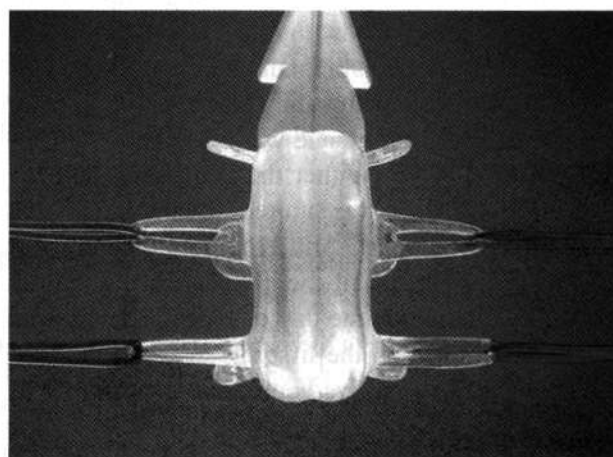


Figure 3. Fixation holes to the gastric wall.

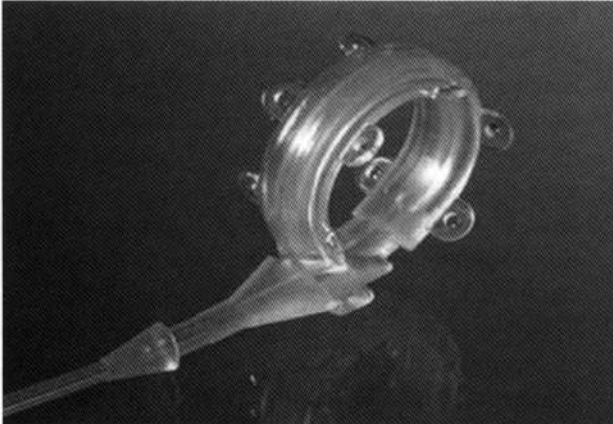


Figure 4A. 1st lock step – internal diameter of 31 mm.

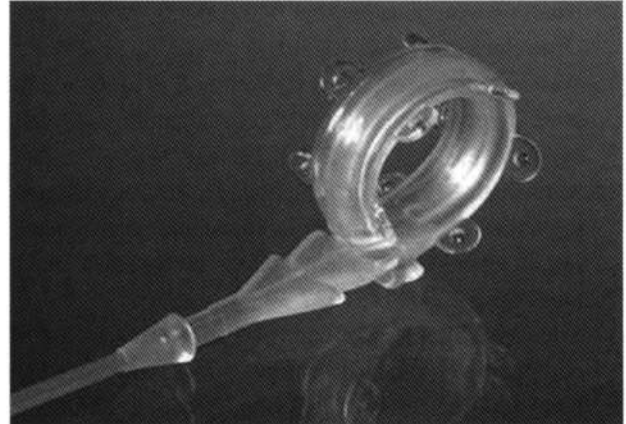


Figure 4B. 2nd lock step – internal diameter of 26 mm.

geon experienced in laparoscopic techniques, is our “first choice” recommendation in patients with morbid obesity. Long-term follow-up of patients with this new band for late complications and weight loss is necessary to validate its use in bariatric surgery.

## Conclusions

The lack of differences in the evaluated very early parameters suggests that the MiniMizer<sup>®</sup> Extra band may become an alternative to the traditional bands. Evaluation of distant therapeutic outcomes and late complications requires a long-term, several-year follow-up.

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