

GASTRIC BANDING WITH FIXATION BUT WITHOUT PPLICATION

Frank Claessens, Steven Bessemans, Tomasz Szewczyk

Most gastric bands require an anterior seromuscular imbrication by gastro-gastric stitches to prevent band slippage. In this chapter, we address the following issues: 1) can the plication be the cause of complications? 2) are there alternative techniques for stabilization of the band? and 3) what is the relevance of a high pressure vs. low pressure band?

Initially bands were placed by the perigastric technique, which not uncommonly led to band slippage. This technique was abandoned in the late 1990s and replaced by the pars flaccida approach, which has greatly reduced the complications of gastric banding. In the standard technique the band is kept in place by a gastro-gastric plication with an average of 3 stitches. However, this imbrication of the band can have three associated issues:

The plication can be made too tight. The higher the pressure exercised by the plication on the band, the higher the likelihood of erosion and migration. Most erosions appear without infections and can be treated well. A migrated band can endoscopically be removed with a specialized instrument and the site closed.

The plication can be made too wide. In this case the band has too much play, and can move and tilt. If it tilts, the gastric lumen can be compromised, which leads to inadequate passage of food or even dysphagia. This obstructive component can also cause pouch enlargement or band slippage.

The plication is made exactly the right size. In this case, the situation is fine. However, as soon as the band is adjusted with fluid, pressure will build up under the plication by the additional volume in the compartment of the band. What was correct at the onset now becomes a situation where there is a risk of erosion and migration. All the pressure has to be maintained by 3 stitches, causing stress on the gastric tissue.

THE QUESTION OF FIXATION

Is fixation of the band necessary, and if so, is gastric plication the best method to do so? Some surgeons no longer fix the band and rely fully on the pars flaccida positioning and the formation of adhesions to stabilize and keep the band in place. However, most surgeons have not adopted non-fixation, because it makes the surgical result too dependent on patient compliance and biological processes that cannot be actively managed.

GASTRIC BAND WITH RETAINING HOOKS

We have used an adjustable, soft elastic gastric band called the MiniMizer[®] Extra (Bariatric Solutions), which has a different approach to the stabilization of the band. This band has 10 elastic loops on the sides (5 on top and 5 on the bottom), which can be connected directly onto the stomach. The band is fixed anteriorly in the area of the angle of His to the crura, which prevents dorsal slippage. Two more sutures (2-0 Ethibond) are placed anteriorly at the top side of the band and 2 more at the bottom side, through the loops (Fig.1).

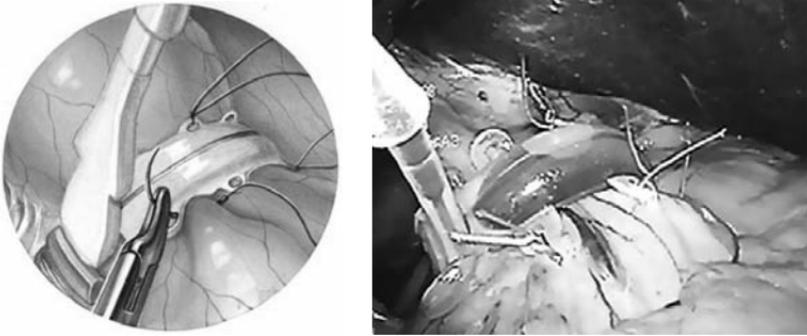


Fig. 1. Left and right: MiniMizer Extra fixed with 5 sutures through hooks.

In our 6-year experience, this has never led to erosion of the loops and/or the sutures. It is important that the sutures are placed seromuscularly and that the pressure on the knot is very light to avoid cutting into the silicone of the loops. The posterior loops are not fixed, because fibroblasts will grow through the loops and after 5-7 days will provide an auto-fixation.

If the band ever needs to be removed, only the retaining loops need to be cut and the band is freed up. In our experience, these fixations are easily removed. It is much simpler and safer to perform a subsequent gastric bypass or sleeve gastrectomy because the gastric anatomy is much clearer and undisturbed.

If the band is inflated, the reduced diameter of the band provides an even increase in pressure on the gastric tissue; the pressure is absorbed by the fixation points around the band.

Obviously, dysphagia, erosion and migration could still occur if the band is too small and too tight. To avoid this situation, the MiniMizer Extra is equipped with two closure positions (Fig. 2), with inner band diameter 31 and 26 mm. Thus, the surgeon can decide intra-operatively which size fits best for this particular patient. This feature is most probably the reason why after 6 years approximately 40% of our patients have not required any fluid adjustments of the band. This has saved time and trouble.

At the University Hospital of Lodz, the fixation of the MiniMizer Extra was not done by sutures, but was entirely based on the tissue ingrowth through the loops,

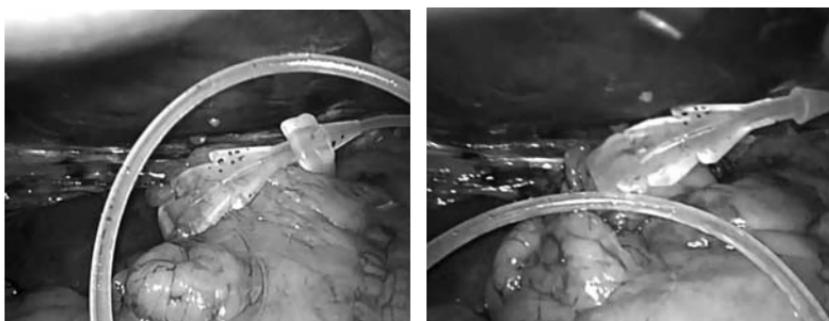


Fig. 2. Left: the two closing positions not yet engaged. Right: band closed in the second position.

thus saving operating time. In a cooperative study between the Hospital Maas en Kempen in Maaseik Belgium and the University Hospital Lodz in Poland, it was studied whether fixation of the loops with sutures gave different results than fixation of the loops by tissue ingrowth. The differences were not significant (Table 1).

The port infections appeared to result from an initial technique in which the access-ports were placed subcutaneously too close to the skin. After revision of this technique, the small port (13 mm diameter) was placed 1 cm below the skin where it is still easily punctured if band adjustment becomes necessary, and the infection rate dropped dramatically.

Table 1. Fixation of the band.

	By sutures without plication	By tissue ingrowth without plication
Center	Maaseik, Belgium	Lodz, Poland
Year of Surgery	2003-2009	2005-2009
No. of Implanted MiniMizer bands	583	372
Follow-up	92.1%	95.6%
Slippage	0.85%	1.61%
Migration	0.51%	0.27%
Dilated esophagus	0.17%	0.54%
Band removal	0.68%	1.07%
Dysphagia	3.25%	4.4%
Port infection	1.37%	2.15%
Male	7%	23%
Female	93%	77%
Average age	44.4	44.8
BMI (kg/m ²)	35-60	32-64
Average BMI	44.8	44.4
% EWL	55	62

The low slippage rates of 0.85% and 1.61% suggest that the direct fixation can be a suitable alternative to the standard gastric plication over the band. Randomized studies will be needed to validate this assertion.

The final question is what is the relevance of a high pressure vs. low pressure band? According to some surgeons, certain bands produce unacceptably high pressure on the gastric tissue. Thus, it has been advocated to use so-called low pressure bands, which exercise less pressure.

However, all gastric bands are designed to reduce the diameter of the gastric lumen. The pressure per mm² to achieve this reduction has to be the same for all bands, regardless of their shape or material. One band cannot achieve the same reduction in size of the gastric lumen by exercising less pressure on the stomach than bands which exercise higher pressures on the tissue. Soft bands will have to be filled up with fluid to reach the same level of pressure on the stomach as bands which have more firmness from the onset. In other words, there are no low pressure or high pressure bands: the pressure is equal for all bands.

Shape is a more defining factor in our view, where the MiniMizer Extra has some special features which we have learned to appreciate. The inner compartment which is filled with fluid with band adjustments is integrated within the outer shell of the band, giving a concentric filling. In almost all other bands that we have used, this compartment was a separate layer on top of the outer shell. This allowed the inner compartment to move independently from the outer shell, thus making the compartment follow the path of least resistance, often being the sides of the band, not contributing to the reduction of the gastric lumen. This can create shapes and forms that lead to situations where pressure is exercised in an unequal manner, thus creating the basis for erosion and migration. This is not the case with the MiniMizer Extra, where every ml of adjustments is directed to the center of the circle of the band.

In summary, we have found this band to be safe and reliable, with the principal of retaining eyelets without imbrication to secure the band and prevent dislocation.

KEY ARTICLES

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