

Laparoscopic treatment of inguinal hernia – TOM (transabdominal onlay mesh)

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Abstract

Aim: To present experience and results from application of the transabdominal onlay mesh (TOM) approach in treatment of inguinal hernia.

Material and methods: In the Centre of Mini-invasive Surgery, Hospital Podlesí, Třinec, laparoscopically treated inguinal hernia has been performed since October 1992. Up to December 2004, 5203 patients with 5727 inguinal hernias were operated on. From January 1999 to December 2004, we performed the TOM procedure for 3878 inguinal hernias on 3476 patients (367 bilateral cases).

Results: In the case of unilateral inguinal hernia the average operation length was 21.4 min and in the case of bilateral inguinal hernia it was 31.5 min. The percentage of complications was 1.263% (perioperative 0.284% and postoperative 0.979%). The average age of patients was 51.3 years (17 to 91 years). There were 87.8% males and 12.2% females. In the programme of 1-day surgery, 185 patients were included.

Conclusions: We are convinced that the TOM method is essential in laparoscopic treatment of inguinal hernia and it will be applied more frequently when new prosthetics are developed.

Key words: inguinal hernia, laparoscopic hernioplasty, TOM, new prosthetics.

Introduction

With the progress of mini-invasive surgery methods and their more frequent use in abdominal surgery, laparoscopic surgery of inguinal hernia has been developing for 2 decades. The major advantages of mini-invasive surgery are weaker postoperative pain, better postoperative state of patient, and shorter inability to work. The higher price of laparoscopic treatment could be considered as a disadvantage.

The range of operating methods and types of operations is wide. All methods have their own pros and cons. We are trying to optimise the operative procedure thanks to our experience.

At present 3 types of laparoscopic plasties of the inguinal duct are mostly preferred:

- 1) transabdominal preperitoneal approach (TAPP),
- 2) total extraperitoneal approach (TEP),
- 3) transabdominal onlay mesh (TOM).

Plasties such as intraperitoneal onlay mesh (IPOM), plug plasty, and simple closure of the internal

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ring with a suture are applied sporadically [1]. The Centre of Mini-invasive Surgery in Hospital Podlesi has been performing laparoscopic procedures since October 1992. Until September 2004, 5203 patients with 5727 inguinal hernias were operated on.

Until December 1998 the TAPP approach was the dominating operating method. Other operating approaches were used sporadically in a few cases. Thanks to our experience and knowledge we were able to apply the TOM method with the application of polyethyleneterephthalate silicon impregnated mesh [2]. When we introduced this method we used the term IPOM; however, the approach that we used was different in the extent of preparation and the way of mesh placement and fixation. That is why we have exclusively used the term TOM in the last few years and thus we eliminate the misinterpretation of our favoured method. There were various reasons that led to the introduction of the TOM procedure in laparoscopic treatment of inguinal hernia. One of them was an aim to reduce trauma of the abdominal wall due to a minimized preparation of peritoneum and decreased operating time. The crucial factor which influenced a change of operative technique was finding proof of inability of sufficient mesh placement; for example, in the case of operation of inguinal hernia relapses, because the mesh was in direct contact with intraperitoneally placed organs, there was not extensive adhesion as in the case of other types of operations [3]. Experience with intraperitoneally placed silicon impregnated net convinced us that such a method is a suitable alternative of laparoscopic treatment of inguinal hernia.

Operative techniques

We use 10 mm 30-degree optics, which are inserted with a port supraumbilically localised. Two operative 5 mm ports are placed in medioclavicular lines. In the case of unilateral hernia the operative port is placed on the hernia side at the level of the umbilicus, on the contralateral side slightly lower, so the operative tools include an angle of 90 degrees. The placement of ports can be individually modified by the patient's habit, if known from previous operations. During the operation the patient is placed in the Trendelenburg position. The operation begins after capnoperitoneum insufflation 12 mm Hg with exploration of the abdominal cavity and

specification of local conditions. In the inguinal region are prepared Cooper's ligament and ramus superior ossis pubis, which is denudated up to the symphysis area. We pay great attention to the front wall of the urinary bladder and we attempt precise and immediate haemostatics. When the prevesical area is loose enough we continue with the preparation of a single hernia sac. According to its size and location we opt for total preparation of the hernia sac. Partial clipping off, extraction and fixing of the sac to Cooper's ligament or ramus superior ossis pubis seems to be convenient in the case of large hernias. When preperitoneal lipoma is present in the spermatic funicle we always perform a resection. Subsequently, when it is necessary we loosen the sigma or caecum to create sufficient space for loose mesh placement [4]. We use polyethyleneterephthalate silicon impregnated mesh with minimum size 15 × 10 cm. After implantation of the mesh in the abdominal cavity through a 10 mm wide port, the mesh is placed in the inguinal region in such a way that the hernia area is underneath. The mesh should extend to the symphysis (as a medial or supravescical hernia precaution). The mesh is fixed to the ramus superior ossis pubis mostly with two screws and the area of the upper outer edge with one screw. In the case of optimal mesh placement further fixation is not necessary. Frequently, fixation is added on the upper inner edge and/or further fixation is applied in accordance with the need. The mesh is not peritonealized.

We do not use one large prevesically pulled in mesh in operations on bilateral hernia any more. At present, we mostly apply two nets, size 15 × 10 cm [5], which slightly overlap in the symphysis area.

The control of haemostatics and desufflation of capnoperitoneum accomplish the operation, which is done by visual check of mesh placement.

We do not apply drainage or antibiotic prophylaxis in general; we indicate it individually [6], according to surgical findings and operation development.

Material and methods

From January 1999 to December 2004, 3878 inguinal hernia patients were operated on. Of these, the TOM approach was followed in 3476 patients (402 bilateral cases). Laparoscopic operation is indicated for all patients who have no contraindications and are over 17 years old. The average age of patients was

51.3 years (17 to 91 years). There were 87.8% males and 12.2% females. In our group of patients there were 12.6% inguinal hernia relapses, 11.2% underwent classic surgery and 1.4% laparoscopic procedure. On January 8, 2003 a programme of 1-day surgery began to function for a group in our centre. In this group, also included were cases of acute operations due to incarceration of hernia without intestinal resection.

Results

The average operating time in cases of uncomplicated unilateral hernia was 21.4 min and in cases of bilateral hernia it was 31.5 min. Painkillers were given to patients orally for 2 days after the operation on average, but their use was individual. Painkillers' dosage depends on: hernia size, necessary preparation area, operating time, placement of screws fixing the mesh, type of procedure (unilateral or bilateral hernia, condition after previous operation in the small pelvis area). In the evening of the operation day, the patient drinks liquids and the following day consumes food that is appropriate for the associated illness [7]. The average postoperative hospitalization in our group was 2.1 days (0 to 15 day).

Complications can also occur during laparoscopic operations of inguinal hernias. We were unable to eliminate all complications with the TOM approach. The number of perioperative and postoperative complications is stated in Tables I and II.

We attempted to solve perioperative complications laparoscopically. In the case of bladder perforation we saturated it with continual stitches, permanent catheter insertion and antibiotic therapy. Perforated colon and small intestine were saturated laparoscopically without mesh implantation. In 2 cases, we treated hernia with the classical frontal approach with a Shouldice procedure. In the next case it was a patient with hernia relapse. We noted

massive perioperative bleeding in 5 cases. In 4 cases, bleeding occurred from the epigastric vessels, which we treated laparoscopically. In 1 case the femoral vein was incised due to replacement of grip forceps for scissors in an effort of hernia sac eversion. We were compelled to convert the open operation to treat the wall lesion with suture of veins and arteries.

All postoperative complications were solved with laparoscopic surgery. In the case of intra-abdominal abscess we solved the complication with evacuation and extraction of the mesh by drainage of the abscess cavity with wide-spectrum antibiotic therapy. We solved adhesive ileus with satisfactory results through laparoscopic adhesiolysis without intestine resection. We managed to treat hernia relapse laparoscopically with a new mesh fixation due to its detachment or we covered the defect with a new mesh.

Conclusions

In laparoscopic surgery the TOM approach seems to be a suitable method for inguinal hernia treatment both for patients and surgeons, as it is a safe and quick method according to our 8 years of experience. This method is not exposed to a remarkable number of perioperative and postoperative complications in comparison to other operative techniques of inguinal hernia treatment. Contrary to non-peritonealized mesh and its direct contact with intestine folds and omentum we were compelled to treat the adhesive ileus in 0.3% of patients.

This method is advantageous in treatment of hernia relapses after classical or laparoscopic surgery when it is frequently impossible to perform peritonealization of the mesh. We perceive this method as prospective primarily in introduction of new prosthetic materials into surgery; especially better-tolerated meshes with lower potential for adhesions. Patients who were operated on with

Table I. Perioperative complications

Complications	Number	Percent [%]
Bladder lesion	3	0.077
Small intestine perforation	2	0.052
Colon perforation	1	0.026
Extensive bleeding	5	0.129

Table II. Postoperative complications

Complications	Number	Percent [%]
Intra-abdominal abscess	5	0.129
Adhesive ileus	12	0.309
Hernia relapse	12	0.309
Wound abscess after port	7	0.180
Haemoperitoneum	2	0.052

the TOM method were in most cases suitable for a 1-day surgery programme.

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