

Extraperitoneal endoscopic repair of inguinal hernias - presentation of a cost-effective technique as standard repair



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INTRODUCTION

The inguinal hernia repair is one of the most common procedures in general surgery. In Germany, 230.000 such hernias are surgically treated every year, until recently by applying either the Shouldice or Lichtenstein technique, which have been considered the German national standard procedures. Endoscopic operation of inguinal hernia have not yet been broadly accepted for cost reasons. We describe a technique that has been further developed in our hospital, and that combines aspects of safety and economy.

MATERIAL AND METHODS

This prospective clinical study of the department of surgery of the HELIOS St. Elisabeth Hospital in Hünfeld/Germany bases on 200 inguinal hernias in 153 patients, operated since August 1st 2002, with 128 (84%) of the patients being men and the average age was 52,4 years. All patients were operated in the here described endoscopic extraperitoneal technique by two surgeons in an average time of 29 minutes. In all of these cases we implanted an Ethicon® VIPRO II®- Mesh. For the results, questionnaires were handed out to the general practitioners of the patients, 66% (n=123) of which were sent back. The average follow-up time was X=14 (6-19) months.

DESCRIPTION OF THE TECHNIQUE

The operation is done in general anaesthesia. The patient is in a slight Anti-Trendelenburg position. The procedure starts with a semi lunar infraumbilical incision of 1,5 cm. Now the anterior fascia of the rectus abdominis muscle of the side operated on first is prepared. A 10 mm incision of the anterior fascia is done, so that the muscle belly becomes visible. The preperitoneal space is now widened with a finger.

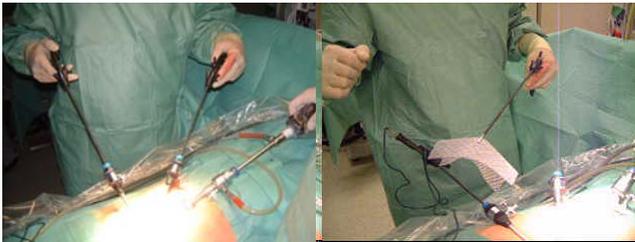


Figure 1: Positioning of the trocars, Figure 2: Putting in the mesh through the 5 mm umbilical trocar.

A conical 10mm trocar is inserted into this space and a pneumo-pre-peritoneum created using a pressure of 12 mm Hg. The 30°-optic is used for further widening of the preperitoneal space. It is carefully advanced towards the pecten ossis pubis. Now between the umbilicus and the pecten ossis pubis two cross-sectional incisions are done in the middle line, dividing it into thirds. Here the endoscopic part of the procedure starts. Through these 5 mm incisions, two 5mm trocars are inserted into the preperitoneal space without causing a lesion to the posterior fascia of the rectus abdominis fascia, so visual control is necessary. By using two forceps for preparation a blunt dissection separating the epigastric vessels from the peritoneum can easily be managed. This dissection is done to the lateral until the linea arcuata is reached. Here the preperitoneal space is further widened by removing the linea arcuata and the peritoneal sac by preparation, all of which simplifies the now following inguinal preparation in the lateral compartment. The indirect hernia sac is bluntly and entirely separated from the testicular cord and placed as far towards the back as possible, so that the mesh can be positioned afterwards. The risk of a peritoneal lesion is highest in this step of the preparation. Large lesions should be closed for avoiding a contact of mesh and gut. Evacuating the pneumo-peritoneum by using a verres-needle may improve the sight in the preperitoneal space. In most patients the creation of the pneumo-pre-peritoneum leads to a spontaneous reduction of a direct hernia. If, however, a direct hernia persists, it can easily be pushed back and separated from the fascia transversalis. A blunt dissection of the urinary bladder towards the back creates a good surface for the application of the 10 x15 cm-mesh, which is subsequently introduced through the 10 mm optic-trocar. The medial and lateral hernia canal must be generously covered by the mesh, overlapping it to an extent of 3 cm so as to avoid a recurrence of the hernia. The mesh is positioned on the back side of the rectus abdominis muscle and extended to the beginning of the peritoneal sac. If the mesh is in the right position a Redon-drain can be put in for the save complete evacuation of the preperitoneal space. A fixation of the mesh is only advisable in very large direct hernias. The pneumo-pre-peritoneum must not be evacuated without visually controlling the position of the mesh. After removing the trocars the infraumbilical fascia is closed followed by skin suture. The Redon drain is removed on the first day after operation. In 90% of the hernias we allow full exertion immediately. No particular rest for more than two weeks is necessary.

RESULTS

In our questionnaires, the patients and the general practitioners were asked about complications after discharge. The most common problems were persisting and disturbing inguinal pain for more than two weeks (n=12). In one patient this pain persisted for more than 4 weeks. We registered 5 inguinal seromas after repair of direct hernias that did not cause any discomfort for the patients and lasted for 2-6 weeks after operation. We saw two recurrences of the hernia, both of which occurred in relatively large scrotal hernias. One early recurrence occurred after 6 days, another one after 6 months. The subsequent operation showed that the recurrence was caused by positioning the mesh, which was probably too small, not adequately. Both patients initially had bilateral hernias operated, with the side that showed the recurrence being the

second one to be operated on. No wound-infections were reported. There was one occult secondary bleeding of hemodynamic relevance (Hb 8,1 mg/dl). This bleeding may have been the result of a lesion of the femoral vein, which was not detected straight away. The revision of the bleeding was done in the same anesthesia. This patient was discharged 5 days after the operation.

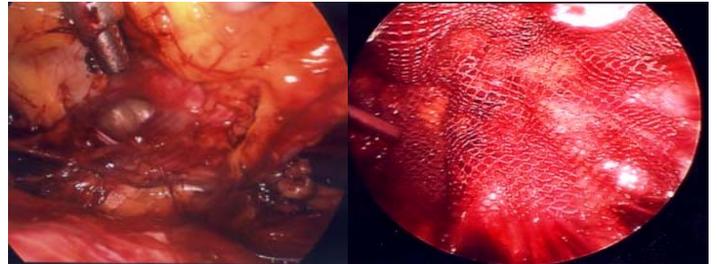


Figure 3: Direct hernia on the right side, Figure 4: Same patient after positioning of the mesh

The other patients left our hospital on the second day after operation at the latest. 83% of the patients reported in the questionnaire to be "very content" with the result of the operation. The intensity of the pain felt after the operation was investigated into by asking the patients to evaluate their pain according to a scale which had 0 for no pain at all and 10 for maximum pain. The average pain intensity felt by all 200 hernia patients on the second day after operation was 3,4 (2-6).

DISCUSSION

Approximately 30% of all patients suffering from inguinal hernia were operated in the endoscopic way in Germany in 2001, with about half of them being done in the extraperitoneal, the others in the transabdominal way. Lengthy discussions proved that both techniques show similar results concerning all relevant aspects. In the transabdominal technique the mesh is implanted using the intraperitoneal approach, whereas the extraperitoneal technique, slightly more demanding in the eyes of some surgeons, does not require the suture of the peritoneum which the transabdominal technique makes necessary.

Our experience has shown that once a specialised surgeon has successfully operated approx. 20 patients under supervision, he may well achieve good results and at the same time avoid a significant learning curve.

The rate of recurrences is in the long run quite comparable to those of successful open techniques such as Lichtenstein. The two recurrences in our study seem to have been caused by an operative mistake, as a



Figure 5: Hernia sac in front of the mesh

consequence, in cases of bilateral hernia we now operate first on the side with the larger hernia so as to ensure the best view possible. Before evacuating the pneumo-peritoneum we carefully check again whether the meshes are correctly positioned. After having introduced these measures, no further recurrences have occurred.

The lack of post-operative pain in this study is impressive. Studies on open techniques which are not free of tension, such as Shouldice, showed significantly higher rates of post-operative pain (an average of 2 points). A stay in hospital of two days at the most, as in our study, seems to be out of reach for patients operated in an open technique.

Up to date literature shows that major complications may be a disadvantage of the endoscopic procedure as compared to the open one, as the latter are performed above the fascia transversalis, which is safer than operating below. However, implanting the mesh below the fascia transversalis is a great advantage for the patient, as it significantly reduces the risk of recurrences

The costs of the extraperitoneal endoscopic hernioplasty are a decisive factor in modern medicine. Our experience shows that the time of operation is more or less the same in both open and endoscopic procedures, while with bilateral hernias the endoscopic technique definitely saves time. Probably the sterilisation of the instruments used for endoscopy causes higher costs.

With both techniques, all instruments can be used several times. As in almost every hospital laparoscopic instruments and a 30°-optic are available, the only instrument that has to be acquired for the endoscopic hernioplasty is a re-usable conical trocar. Only in extremely rare cases is a fixation of the mesh necessary, so that in contrast to the open techniques no material for such sutures must be paid for. The only sutures necessary are for the 10 mm incision of the anterior fascia of the rectus muscle and for the skin.

On the whole the technique we present here appears to be an efficient method with medical and economical advantages, from which in particular patients with bilateral hernia or with recurrences after open hernioplasty may profit.

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