Experience in the use of Single Incision Laparoscopic Surgery procedures and the persistent urge to improve the cosmetic effect have contributed to the introduction of mesh repair of an umbilical hernia by means of a small incision in the natural position of the umbilicus.

The aim of the study was to present the surgical technique and assess its postoperative results.

Material and methods. During the period between 24.08.2011 and 01.01.2013, twenty-three umbilical hernia repair operations with the use of a polypropylene mesh by means of a small incision in the natural position of the umbilicus were performed. The synthetic material was placed in the preperitoneal space. The wound was closed and the umbilicus was reconstructed simultaneously, in order to make the scar invisible. Cutaneous stitches were not used.

Results. The average duration of the operation was 49 minutes. In one case of an obese patient with coexisting linea alba dehiscence, hernia recurrence was observed. All wounds healed without complications. The cosmetic effect was very good.

Conclusions. Based on the presented experience mesh repair of the umbilical hernia by means of a small incision in the natural position of the umbilicus contributes essential benefits, such as a very good cosmetic effect without consecutive increasing costs, as compared to standard treatment by means of an infraumbilical incision.

Key words: umbilical hernia, mesh repair, invisible scar
Mesh repair of umbilical hernia without a visible abdominal scar

Operative technique

The patient was placed in the supine position and the operative field was cleaned three times using Skinsept Color (Ecolab), at the same time, the hernial sac was filled with antiseptic fluid. After the skin was completely dried the apex of the hernial sac was gripped by means of pincers and a longitudinal incision was performed, its length depending on the closure of the reconstructed umbilicus. Usually 3 to 3.5 cm incisions were sufficient. After preparation of the hernial sac with ensuing reduction to the abdominal cavity an oval pouch was created, 5-7 cm in diameter, depending on the size of the hernial ring. Afterwards, the fascia surrounding the hernial ring was unveiled, 2 cm in each direction. The operative field was once again washed with a disinfectant and the wound was demarcated with sterile tablecloths, which was supposed to prevent contact of the mesh with the skin. After excision of an oval polypropylene mesh flap (Aspide Medical – France) it was implanted into the preperitoneal space by means of four non-absorbable sutures (fig. 1). The securing sutures were placed as far away from the edge of the defect as possible, no less than 2 cm. In case of a larger mesh the suprafascial suture was implanted through a flattened subcutaneous layer, which led to the displacement of the suture up to 2.5 cm from the edge of the hernial ring and the mesh was grasped respectively farther from its edge. In case of a narrow hernial ring (<1.5 cm) is was widened in the transverse line. An important element considering the mentioned technique is to establish the sutures securing the mesh in the previously prepared pouch. The fixation of consecutive sutures directly after their implantation, due to the narrow hernial ring, hinders mesh placement and fixation. The hernial ring was sutured transversely with absorbable sutures (Polysorb 2-0) above the mesh. They were placed close by edge of the facial, in order to avoid folding mesh (fig. 2). The wound was...
closed similarly as in case of the SILS technique, by means of three absorbable sutures (Polysorb 3-0), with the middle suture fixing the skin to the fascia, thus, reconstructing the umbilicus (3, 4). Cutaneous sutures were not used. The wounds were not tightly sealed, in order to allow the outflow of a serous-hemorrhagic secretion, and its absorption into the dressing.

RESULTS

The mean duration of surgery was 49 minutes (ranging between 70-35 min). The first procedure lasted 70 minutes, while the following did not exceed 60 minutes. In most cases patients were discharged from the Department of Surgery on the second day after the operation (four were discharged on the day of surgery). During the early postoperative period complications were not observed. All wounds healed by first intention. No pathological secretions were observed from the postoperative wound. In all cases the final cosmetic effect was very good, assessed both by the patient and physician (fig. 3, 4 and 5). One patient presented with hernia recurrence at the site of the linea alba, three months after surgery. In view of the patient’s concomitant dehiscence, anterior abdominal wall plasty was performed with simultaneous closure of the recurrent umbilical hernial ring, by means of the implantation of a polypropylene mesh, 20 x 10 cm in size, with good effect.

DISCUSSION

Currently, one can come to the conclusion that the introduction of synthetic material in case of abdominal hernia repair significantly improved treatment results (2). The randomized, prospective, comparative study conducted by Arroyo et al. concerning umbilical hernia surgery with and without the use of synthetic material showed reduced hernia recurrence from 11% to 1% in favor of mesh repair (5). The classical approach in such cases is the semi-circular incision, 2cm below the navel, 5 cm or more in length. This gives a good insight into the operative field and allows proper mesh implantation. However, its main disadvantage is the presence of a visible postoperative scar located in the central part of the abdomen.

The laparoscopic technique was supposed to be an answer to the management of abdominal hernias. The cosmetic effect was thus improved, because after surgery one observed two or three insignificant scars on the side of the abdomen. The recurrence rate was also
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comparable (6). However, based on our own experience the navels after laparoscopic procedures are usually wide and shallow, which does not always meet the expectations of patients, especially in case of women. The possibility of trocar site hernia development is a disadvantage of the laparoscopic technique (7). Helgstrand et al. conducted a large study involving, both adults and children demonstrating that the total number of trocar site hernias ranged between 0-5.2% (8). The undoubted disadvantage of the above-mentioned method is the very high cost of the laparoscopic procedure (2, 9). This is associated with the high costs of the intraperitoneal mesh and fixing „takers“.

The proposed operative method seems to be a solution, which significantly improves the final cosmetic effect without increasing costs, as compared to classical surgery. One should not forget that the above-mentioned technique is dedicated to patients with small hernias, which do not exceed 5 cm in diameter. The size of the hernia considering qualification for surgery was associated with the need to perform a relatively small incision so that at the end of the basic part of the procedure the postoperative scar could be hidden inside the reconstructed umbilicus. Paradoxically, the above-mentioned activity was easier, the thicker the subcutaneous abdominal layer, thus, best cosmetic effects were obtained in case of patients with the BMI ranging between 27-30 kg/m². The biggest challenge considered a patient with the BMI of 20.7 kg/m², since the symbolic representation of the subcutaneous layer was responsible for the fact that the navel was completely flat. In order to obtain a good cosmetic effect reduction of excessive skin was required.

Due to the small number of operated patients (23 patients) and relatively short observation period (8-24 months), one should carefully refer to the obtained results. However, initial results look promising. One case of hernia recurrence, which was observed three months after surgery was probably associated with poor qualification for surgery. The above-mentioned concerned an obese patient (BMI 34.5 kg/m²) with coexisting linea alba dehiscence above the umbilicus. According to the authors, in such cases it is necessary to implant a larger mesh high above the umbilicus. In case of a small incision in place of the natural position of the navel the above-mentioned is impossible.

When we began to perform in our department laparoscopic operations by means of the navel approach, we feared operative wound infection complications. It is well known that in case of poor wound healing after laparoscopic procedures, one should always consider umbilical wounds. However, our experience shows that if we are aware of the potential threat of infection and properly prepare the operative field, the above-mentioned fear is unjustified, even in case of synthetic material implantation. This was confirmed by the fact that infectious complications were not observed.

A very important element of the above-mentioned operation is particular care of hemostasis and atraumatic handling of the operative wound. One should especially avoid wound distention, which in case of thinned skin covering the hernial sac might lead to contusion, disruption, and necrosis. The skin in this area is very mobile, thus, the possibility to visualize the area with small hooks. One should also not forget to ensure good hemostasis before navel reconstruction, since even insignificant bleeding might lead to complications. Given the fact the the possible fluid reservoirs in the area spontaneously absorb poorly, the Authors’ recommend to avoid tight closure of the operative wound and application of a moderate compression during the first postoperative day. Such management has a very beneficial effect on the final cosmetic result.

Based on the previous experience of the authors’, one can come to the conclusion that the presented umbilical hernia operation with mesh implantation with an incision at the site of the natural location of the navel is beneficial with a very good cosmetic effect, without simultaneous increase of costs, as compared to classical surgery. Due to the small patient group and short observation period, one should refrain from unequivocal evaluation of possible recurrence. However, it should be emphasized that in case of properly qualified patients subjected to surgical management by means of the above-mentioned method, recurrence was not observed.
REFERENCES