Recurrent incisional hernia sublay repair with fully reabsorbable monofilament mesh – a case report

Incisional hernia is a common postoperative complication of abdominal surgery, with the incidence ranging from 11% up to 20% of all laparotomy incisions [1, 2] and the most common indication for reoperation after laparotomy [3]. It is defined as a defect occurring through the operative scar, caused by a failure of the lines of closure of abdominall wall. Thereby, it is the only hernia considered to be truly iatrogenic. The most common incision of previous surgery leading to incisional hernia is the infraumbilical or supraumbilical midline incision, followed by Pfannenstiel's incision, paramedial, lumbar and right subcostal [4, 5]. Not only a closure technique and suture materials have an effect on hernias incidence. Postoperative wound infection and patient factors, such as advanced age, obesity, diabetes mellitus,
tobacco abuse, hypoproteinemia, corticosteroid use and immunosupresion are established risk factors of hernia formation likewise [4, 6, 7].

Most of incisional hernia require elective surgical repair, because of becoming larger and causing morbidity complications if left untreated. A great variety of surgical techniques have been adopted for the repair of abdominal incisional hernias. Nowadays, the best results are believed to be achieved by the implantation of prosthetic mesh [8] and the use of prosthetic material is almost a standard practise. Fibrous tissue, while growing in the porous mesh, consolidates the abdominal wall and disperses intraabdominal pressure, to prevent a recurrence of hernia. Anatomical repair is associated with recurrence rates about 23-50% [9, 10, 11] in comparison to 1,5-10% following prosthetic mesh repair [12]. As in general, diabetes mellitus, obesity, smoking, postoperative straining and advanced age are also established risk factors of recurrence [4]. Despite of its significant benefits, a mesh should be treated as a foreign material and susceptible to infection, sinus formation or enteric fistulization [13]. The foreign body implantation may lead to chronic inflammation or excessive fibrosis and may result in increased stiffness and loss of pliability at the site of sewing [10, 14].

There is no general agreement as to the best choice of one of many prosthetic mesh repair techniques that have been proposed. The material can be placed between the subcutaneous tissues of the abdominal wall and the anterior rectus sheath (named onlay method) as well as in the preperitoneal plane created between the rectus muscle and posterior rectus sheath (named sublay method). This study reports a case of usage of a fully reabsorbable Phasix Mesh for sublay hernioplasty of recurrent incisional midline hernia after a primary surgery by Pfannenstiel’s incision and hernioplasty with polypropylene mesh complicated by surgical site infection.

**CASE REPORT**

In July 2014, 62 y.o. female admitted to the surgical department with a complaint of the recurrent ventral hernia and the symptoms of pain and movement limitations while performing activities of her daily life. She testified, that she underwent gynecological procedure by Pfannenstiel’s incision few years ago. Her comorbidities were hypertension, diabetes mellitus and obesity (BMI = 35).

Her past medical history revealed an incisional hernia repaired with polypropylene mesh in January 2014, complicated with a large hematoma (sized 200 x 120 x 90 mm). Transdermal puncture and drainage with a subsequent antibiotic prophylaxis (ciprofloxacin) were successfully performed then. In March 2014, control ultrasound examination showed giant multichamber seroma (sized 130 x 70 x 140 mm) in the lower part of anterior abdominal wall tissues. Those abnormal fluid collections remained under medical carefull control. In June 2014, another antibioticotera- py (metronidazol and cefuroxime) was administered, but pathological conditions still maintained unhealed. As a result of her first consultation in our department, computer tomography of the abdomen was administered. It revealed a midline gap of hypogastric linea alba, sized 130 x 110 mm, with concomitant inflammatory infiltration of the surrounding adipose tissue. Any pathologic fluid collection within the abdominal cavity wasn’t found. Therapy with cefuroxime was continued with sufficient result. Patient was qualified for operative treatment. In May 2015, direct preoperative examination revealed palpable midline gap sized about 13 x 8 cm [Fig. 1, 2]. Computer tomography showed midline ventral hernia (137 x 112 x 56 mm trans x cc x ap) containing mesenteric adipose tissue and distended loops of small intestine within numerous adhesions. The hernia gate was measured on 104 x 75 mm [Fig. 3].

Under general anesthesia, open sublay hernioplasty (with the mesh placed in the retromuscular space) was performed [Video 1]. Patient was prepared and an antimicrobial-impregnated adhesive drape was placed over the skin of the anterior abdominal wall. The abdomen was accessed through a midline incision, mostly through the previous scar. A single dose of cefazolin (2,0 g intravenously) was administered at the time of skin incision. In a first step, an inflammatory tumor around previous polypropylene mesh was resected and residual prosthetic material was explanted [Fig. 4]. Peritoneal adhesions were released [Fig. 5]. Then, the sac was delineated [Fig. 6]. Its contents was reduced and discharged into the interior of the abdominal cavity. The fascial defect was identified all around. The preperitoneal dissection of the anterior abdominal wall, allowing for mesh to be extended, began. When the posterior fascia has been released, the edges of the defect were reapproximated with running non-absorbable polydioxanone (size: 1.0) sutures [Fig. 7]. After that, Phasix Mesh sized 4” x 6” (10 x 15 cm) was placed into retromuscular space and anchored by suturing it to the rectus sheath [Fig. 8]. Additional simple sutures were placed on either side laterally to ensure its flat position [Fig. 9]. In the next step, anterior fascia was finally reconstructed over the mesh with a running polydioxanone suture (size: 1.0) [Fig. 10, 11]. Then, hemostasis was attained and two suction drains were placed in subcutaneous plane superficial to the mesh. Next, the excessive skin and subcutaneous tissue were reduced through additional incision needed in Pfannenstiel’s line. Endmost, the wound was closed [Fig.12].

In the postoperative period, patient required analgesic treatment only for 24 hours. The drains were removed in second postoperative day and she was discharged at the third day of hospital stay with no direct postoperative complications.

Two weeks later, she attended a clinic as an outpatient with delayed wound healing caused by
The concern with the open approach to incisional type III collagen deposition in a porcine model, when the rectus space demonstrates more of both type I and type III collagen deposition in a porcine model, when mesh placed in the rectus muscle. It was proved by Binnebosel and colleagues on their rabbit model of open incisional hernia repair, that mesh placed in the retrorectus plane prevents the transmission of infection from subcutaneous tissues down to the mesh [29]. Otherwise, there is a necessity to perform mesh reinforcement in contaminated area in some cases. It significantly affects the success of the operation. When repairing a contaminated abdominal wall defect, the sublay method provides the opportunity of rapid revascularization that prevents a material failure, improve bacterial clearance and long-term success of the repair [30]. Placing a mesh in a poorly vascularized area increases the risk of its early degradation by bacterial collagenase prior to achieving neovascularization and utilization of the native host immune system. Using a bioabsorbable or even biologic grafts in the retrorectus compartment is hypothesized to improve the outcomes related to recurrence rates when contamination is present [28]. Those products significantly raise the cost of the procedure. However, if infectious complications can be avoided, cost would be offset by offering value to the patient.

In presented case of recurrent incisional hernia with a previous history of many wound complications, a procedure of sublay reinforcement with fully resorbable mesh implant (Phasix Mesh) was performed. The used material degrades through the processes of hydrolysis and a hydrolytic enzymatic digestive process within 12 to 18 months. There was no recurrence in 4 month follow-up observation. An episode of surgical site infection has been effectively healed with no further complications.

The role of bioabsorbable implants in contaminated cases has not been determined yet, and ongoing prospective studies are indispensable to provide guidance for these difficult patients. The concern for mesh infection must be weighted against the concern for recurrence.
CONCLUSIONS

Retrorectus (sublay) method of mesh reinforcement is preferable in incisional hernia repair, that provides 2-layered closure of the midline fascia to recreate native abdominal wall anatomy. A surgical site infection, as well as implanted foreign body contamination, significantly increases the risk of recurrence. Using the bioabsorbable implants, that completely hydrolyze after providing a support throughout the period of soft tissue healing, is suggested in contaminated area. Despite its encouraging outcomes, a cost factor still existst and further prospective studies are necessary to establish its position in incisional hernia surgery.

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VIDEO 1. RECURRENT INCISIONAL HERNIA SUBLAY REPAIR WITH FULLY REABSORBABLE MESH

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