The authors present two patients operated on for large incisional hernias with additional abdominal disorders requiring surgical treatment. The first patient was scheduled for cholecystectomy whereas the second one for partial resection of the small bowel. Since those hernias did not qualify for classical operations due to extensive destruction of the muscular and fascial layers of the abdominal wall the patients underwent repair with modern composite meshes. Those meshes can be applied directly on the bowel loops. Of the two patients a polyester mesh coated with polyethylene-glycol-glycerol-oxidized bovine atelocollagen was applied in the former whereas a polypropylene monofilament mesh coated with a layer of silicone in the latter. Those biomaterials coating the visceral surface of the meshes prevent them from adherence to the bowel loops. What is more, inflammatory response to the foreign body with following adhesion formation and as a result either bowel obstruction or enterocutaneous fistulas can be reduced. The postoperative course was uneventful in both patients in spite of the operations being performed in the contaminated field.

**Key words:** incisional hernia repair, composite mesh

Incisional hernia repair is one of the most frequent operations performed in departments of general surgery today. Postoperative hernias occur in 5% of patients undergoing abdominal surgery (1). Incisional hernias can be divided into small, middle and large ones according to the diameter of a hernia orifice. The diameter is below 5 cm in a small hernia, through 5 to 10 cm in a middle hernia and over 10 cm in large hernias. The small or middle hernia repair can be performed either by primary closure or the defect in the abdominal wall can be closed with the patients’ own tissues (2). Those classical methods of herniorrhaphy are not suitable for a large hernia with high rate of recurrence because sutures are put under tension during those operations in most cases. Recent data suggest that the use of a prosthetic mesh for a large hernia repair with significant destruction of the muscular and fascial layers reduces the recurrence rate. There should be an increase use of prosthetic meshes for hernioplasty despite the risk of other complications such as mesh infection, seroma or dislocation of a biomaterial (3).

**CASE REPORTS**

1. A patient P.N., age 53, case report No 8708/2009 was admitted to the Clinic on 4th of May 2009 because of a large, reducible incisional hernia located in the epigastrium with substantial destruction of the muscular and fascial layers of the abdominal wall and due to chronic cholecystitis. Acute haemorrhagic purulent necrosis of the pancreas and extensive stomach fistula which occurred in October 1997 were the cause of a significant destruction of the abdominal wall. At that time the patient was treated in a county hospital through 14th of October to 4th of November where he underwent debridement with peritoneal lavage and gastrotomy with oversewing of bleeding stomach ulcer. That severe disease and a couple of laparotomies resulted in dehiscence of gastrotomy, evisceration, septic necrosis of the...
pancreas and abscesses of the peritoneal cavity. Afterwards he was hospitalized in the Clinic from 4th of November 1997 to 23rd of January 1998. Then he developed pancreatic fistula, pseudocyst and aforementioned stomach fistula. Open abdomen technique, a ventilator treatment, antibiotics, parenteral and enteral nutrition were introduced and pancreatitis and the stomach fistula were cured. The severe disease resulted in a substantial destruction of the muscular and fascial layers in the epigastrium in the form of an extensive cicatrix which was covering the anterior wall of the stomach with contraction of the abdominal muscles typical of open abdomen technique method. Since he developed in a few years chronic cholecystitis he was convinced to undergo one stage incisional hernia repair with cholecystectomy.

After preliminary preparation and prolonged prophylactic antibiotics that is amoxicillin with clavulanic acid to the third postoperative day cholecystectomy and hernioplasty with composite mesh on 19th of May was performed. Cicatrix covering the stomach was partially excised. The peritoneal cavity was opened and multiple adhesions between the duodenum, bowel loops and the parietal peritoneum were released. The gall-bladder with thick wall filled with small stones was removed. Since it was impossible to bring margins of the wound together and due to the lack of the parietal peritoneum within the wound a composite polyester mesh coated with polyethylene-glycol-glycerol-oxidized bovine atelocollagen (Parietex Composite, Sofradim, Trévoux, France) 37 and 28 cm in diameter was applied on the viscera directly. The mesh was anchored to the abdominal wall with eight nonabsorbable sutures in the shape of U put through all layers of the abdominal wall and hidden under the skin. Finally, the mesh was stretching between the xiphoid process and about 5 cm below the umbilicus vertically and between the midclavicular lines horizontally (fig. 1). Single sutures were put on the subcutaneous tissue directly on the mesh and final stitches on the skin. The postoperative course was uneventful and the patient was released home on 23rd of May in a good general condition. Sutures were removed after 14 days. He remains under control for 4 months in the outpatient department and no complications were recognized.

2. A patient A.C., age 52, case report No 11322/2009 was admitted to the Clinic on 8th of June 2009 due to a large postoperative hernia located in the right hipogastrium with significant damage to the abdominal wall layers and with loop-ileostomy within the hernia. Acute, diffuse, faecal peritonitis which the patient developed in 1985 was the cause of a substantial destruction of the abdominal wall. He was hospitalized in a county hospital through 26th of May to 31st of July. At that time he presented with signs of acute cholecystitis and therefore gall bladder excision was done on 30th of May. In the postoperative course the patient developed pyrexia with peritoneal signs in the inguinal fossa and positive Goldflam sign on the right side. Another laparotomy was performed on 4th of June and perforated, retrocecal, ascending and gangrenous appendix was recognized, removed and the peritoneal cavity drained. Dehiscence of the appendix stump with diffuse, faecal peritonitis and evisceration occurred. Open abdomen technique, antibiotics and fluids treatment were introduced and peritonitis and the caecum fistula were cured. That severe disease resulted in a substantial destruction of the muscular and fascial layers in the hypogastrium with the right rectus muscle atrophy. The patient was hospitalized a few times due to incarcerated hernia with non operable reduction until 2008. On 13th of November 2008
partial resection of the small bowel with diverting loop-ileostomy without hernioplasty was performed because of strangulation.

After initial preparation and prolonged prophylactic antibiotics that is amoxicillin with clavulanic acid to the third postoperative day partial resection of the ileum with loop-ileostomy and end to end anastomosis and hernioplasty with composite mesh was performed on 18th of June. The hernial sac was opened with a vertical incision going between the stomy and cicatrix. Bowel loops and the great omentum attached to the sac were released. The bowel loop with stomy was excised and one-layer end to end anastomosis performed. Since it was impossible to bring margins of the wound together a composite polypropylene monofilament mesh coated with a layer of silicone (Surgimesh WN Non Adherent, Aspide Médical, France) 30 and 20 cm in diameter was applied on the viscera directly and it was anchored to the abdominal wall with eight nonabsorbable sutures hidden under the skin. The skin was sutured directly over the mesh. The postoperative course was uneventful and the patient was released home on 30th of June in a good general condition. Sutures were removed until 3rd of July. The patient remains under surveillance in the outpatient department for 3 months. There are no complications until now.

DISCUSSION

The authors present patients operated on for large incisional hernias with additional abdominal disorders requiring surgical treatment. Those hernias did not qualify either for classical operations or application of a traditional nonabsorbable meshes due to extensive destruction of the muscular and fascial layers of the abdominal wall, contraction of the muscles and the lack of the parietal peritoneum within the hernial sac which could be used to separate that mesh from the viscera. Therefore, composite meshes were used in those patients which can be applied on the bowel loops directly. Of the two patients a polyester mesh coated with polyethylene-glycol-glycerol-oxidized bovine atelocollagen was applied in the former whereas a polypropylene monofilament mesh coated with a layer of silicone in the latter. It is not necessary to suture composite meshes to separate layers of the abdominal wall. Those prostheses should be unfold carefully on the viscera and anchored to the abdominal wall with single sutures to prevent meshes from translocation. The meshes are pinned against the posterior surface of the abdominal wall due to increased pressure within the abdominal cavity (4). Chronic inflammation of gall bladder in the first patient and ileostomy with bowel resection in the second one were additional risk factors of infection.

Tension-free repairs of hernias with nonabsorbable meshes displace today the classical methods of treatment because of a few fold reduction of recurrence rate (4). Polypropylene meshes are used most frequently. Those meshes are applied between certain layers of the abdominal wall. They are introduced either between layers of the peritoneum, between the peritoneum and fascia (inlay method) or on the fascia (onlay method). However, in a case of significant destruction of the abdominal wall when a mesh should be put on bowel loops directly the polypropylene mesh is not suitable. That biomaterial if applied on the viscera could lead to dramatic inflammatory response, following massive adhesions and as a result either bowel obstruction or enterocutaneous fistulas of the involved bowel loop. Only modern composite meshes with barriers which decrease the adhesion formation and therefore can be applied on the bowel loops directly (sublay method) (5). Absorbable hyaluronic acid with carboxymethylcellulose, complex of polyethylene-glycol-glycerol-oxidized collagen and nonabsorbable polytetrafluoroethylene or silicone are the most common biomaterials used for antiadhesive barriers. The abdominal cavity remesothelializes and separates the introduced mesh within 5-8 days. The complexes coating meshes decrease adhesion formation primarily during that period of time (6).

High costs and the risk of infection complications affecting a few percent of patients are the most important drawbacks of composite meshes application. An infection can occur even a few years from an operation. Abdominal surgery complications such as bowel anastomosis dehiscence increase the risk of prosthetic biomaterial rejection. Nevertheless, composite prostheses can be applied in a potentially contaminated operating field in the patients operated on electively like in
presented patients. It is not acceptable to cut the meshes in an attempt to match them with the hernia size. Exposure of bowel loops to free mesh filaments could increase adhesion formation with following complications such as obstruction or fistulas (7). In spite of certain morbidity after hernia repairs with composite meshes it is the only method for selected group of patients with large incisional hernias.

REFERENCES


Received: 5.10.2009 r.
Address correspondence: 60-355 Poznań, ul. Przybyszewskiego 49