

Small bowel obstruction caused by mesh migration. Case report

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SUMMARY: Small bowel obstruction caused by mesh migration. Case report.

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Introduction. Endoscopic hernia repair methods have become increasingly popular over the past 15 years. Nonetheless, there is no consensus regarding an optimal fixation method. Transabdominal sutures and titanium tacks or staples are the most traditional ones.

Case report. We present a case of mechanic small bowel obstruction

due to mesh migration occurring one year and a half after incisional hernia repair with polytetrafluoroethylene mesh fixed by spiral tacks.

Discussion. Titanium spiral tacks are dangerous because of their sharp components, which can damage organs such as the small intestine, by causing microperforations. The type of prosthesis used has also contributed to the intraluminal migration, since polytetrafluoroethylene mesh is very flexible and poorly integrates in the abdominal wall.

Conclusion. A prosthesis of a different material combined with a different fixation system such as absorbable tacks, biological glue, or mechanical tacks without sharp components, would have obviated mesh migration.

KEY WORDS: Mesh migration - Small bowel obstruction - Polytetrafluoroethylene.

Introduction

Endoscopic hernia repair have become increasingly popular over the past 15 years. Main advantages of the endoscopic techniques are: lower postoperative pain, earlier recovery, and lower recurrence rates (1). Fixation of the endoscopic mesh seems to be necessary to minimize the risk of recurrence. The fixation technique involving the use of prosthetic materials has been significantly developed in recent years with the advent of semi-absorbable two-layered prostheses for intraperitoneal placement. Successful ventral hernia repair must combine an ideal mesh prosthesis with as much as ideal fixation device. There is no consensus regarding an optimal fixation method. Transabdominal sutures and titanium tacks or staples are the most traditional fixation methods. These permanent devices may lead to complications. Transabdominal sutures can cause chronic pain syndromes

by entrapping sensory nerves. Titanium tacks or staples can cause excessive adhesions and may lead to the penetration and perforation of hollow viscera, if falling away from the abdominal wall (2, 3).

Ideal fixation device must provide strong adherence of mesh to the abdominal wall while minimizing complications deriving from the fixation type. Novel screw-type fasteners have been developed to provide adequate mesh fixation while avoiding the well-known complications associated with other devices.

This report presents a case of mechanic small bowel obstruction due to mesh migration, occurring one year and a half after incisional hernia repair with polytetrafluoroethylene mesh, fixed by spiral tacks.

Case report

A 59 year-old man presented to our Emergency Department reporting abdominal pain, vomiting and sub-occlusive episodes. In history: type 2 diabetes; trauma with laparotomy and splenectomy, incisional hernia repair according to Rives, exploratory laparotomy for recurrent incarcerated incisional hernia, with mesh removal (2009); laparoscopic incisional hernia repair (at another institution - 2010) with Gore-Tex® (W. L. Gore & Associates, Inc. Medical Products Division, Flagstaff, Arizona) and ProTack™ 5mm Fixation Device (Covidien Healthcare, Mansfield, MA). White X-ray abdomen,

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shows multiple air-fluid levels attributable to the small intestine, mostly in mesogastric region. A nasogastric tube was positioned and he was admitted in the Surgical Ward to restore electrolyte balance and undergo thorough investigation.

Abdominal CT record showed: "No intra-abdominal free air. No abdomino-pelvic free fluid. Previous splenectomy. Compared to previous CTs, the solid tissue adhering to the pancreatic tail (probable island of splenosis) appears substantially unchanged. In mesogastric region, below the anterior abdominal wall, a highly hyperdense tubular material is present, inside the gut, referring to previous surgical hernia repair with mesh. The loops are quite extended upstream with some small air-fluid levels. The solid tissue fringed in the context of the abdominal wall, probably fibrotic, does not present a particular enhancement on phase contrast-enhancement. No fluid collections in its context. Appearance of multiple reactive mesenteric lymph nodes. No focal lesions or biliary dilatation. Kidney size and morphology within normal limits, with no signs of urinary stasis. No adrenal swelling. No aneurysmal dilatation of the abdominal aorta". (Fig. 1).

The patient was therefore submitted to laparotomy, with detection of massive fibrosis encompassing non-resorbable mesh of previous plastic according to Rives; recognition, at the opening of the peritoneum, of the intestinal coil inseparable from the abdominal wall; en-bloc resection of intestinal coil for a total of about 70 cm and peritoneal-fascial layer, with ileal resection and latero-lateral manual double layer anastomosis. In the surgical specimen (Fig. 2) was visible, inside of the lumen of the small intestine, a prosthesis that macroscopically refers to Gore-Tex® mesh (W. L. Gore & Associates, Inc. Medical Products Division, Flagstaff, Arizona) (Fig. 3); ProTack™ 5mm Fixation Devices (Covidien Healthcare, Mansfield, MA) were also visible (Fig. 4). Laparotomy was closed *en masse* by Maxon-loop.

Definitive histology showed a 40 cm segment of small bowel with a white-yellow mass of 14x11x5 cm with microscopic findings of inflammation granulocytes, perivisceral lymphoplasmacytic ma-

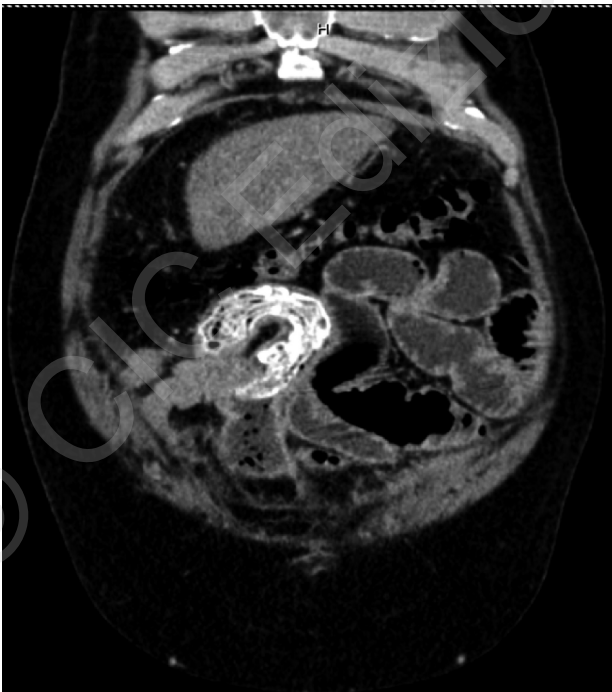


Fig. 1 - CT image showing small bowel obstruction and a hyperdense tubular material, into the gut, referring to previous surgical hernia repair with mesh.



Fig. 2 - Surgical specimen.



Fig. 3 - At the opening of the bowel, inside the lumen of the small intestine, is visible prosthesis that macroscopically refers to Gore-Tex® mesh (W. L. Gore & Associates, Inc. Medical Products Division, Flagstaff, Arizona).



Fig. 4 - Particular of surgical specimen: ProTack™ 5mm Fixation Devices (Covidien Healthcare, Mansfield, MA).

crophages associated with reactive fibrosis phenomena and fragments of surgical wires. Prosthetic tissue sample was 16x16 cm.

The postoperative course was characterized by wound infection resolved by drainage. The patient was discharged on postoperative day 15th, with outpatient medications for other 3 weeks. At 3 months after surgery the patient is in good condition, with a well-established wound, and without clinical evidence of incisional hernia.

Discussion

In our experience (more than 500 laparoscopic incisional hernia repair) this was the first case of mesh migration into a hollow viscus. Some literature described cases of mesh migration into peritoneum (4-15), but in most of these cases meshes were not absorbable or non-absorbable plug was used in inguinal hernia repair. Some cases of perforation and intraluminal migration of mesh as result of transabdominal pre-peritoneal (TAPP) repair with mesh fixed with spiral tacks have been also described (2, 3). We think that titanium spiral tacks are dangerous because of their sharp components, which can damage organs such as the small intestine, causing microperforations. We believe that the dual-component mesh have a lower intrinsic capacity of creating adhesions, allowing a better incorporation to the abdominal wall and ensuring an adequate resistance. In this case we believe that the type of prosthesis used has also contributed to the intraluminal migration, because polytetrafluoroethylene mesh is very flexible, and also because this kind of mesh has poor integration in the abdominal wall (8, 16). Less flexible, although light, mesh such as Physiomesh™ (Ethicon, Inc., Cincinnati, OH, USA), a par-

tially absorbable macroporous mesh, or Parietex™ (Covidien Healthcare, Mansfield, MA) would prevent migration also because much more encompassing the abdominal wall.

Essential requirement for the success of the plastic hernia is the correct positioning of the prosthesis, that must be centered on the defect and fixed by double crown. From this point of view, for incisional hernia there are mechanical fasteners that avoid the problems of spiral titanium tacks, and still ensure the correct and stable positioning of the prosthesis, such as absorbable tacks or Endopath™ EMS Endoscopic Multifeed Stapler (Ethicon, Inc., Cincinnati, OH, USA).

Conclusions

In our case, we believe that several factors have caused the complication: multiple laparotomies have created a fibrotic reaction and a chronic inflammation in the abdominal wall which, together with non-absorbable tacks, probably with poor fixation, and mesh material, caused adhesions between the prosthesis and intestines. Over the years, because of this chronic inflammatory reaction and perhaps of a microperforation caused by spiral tacks, the entire polytetrafluoroethylene prosthesis is eventually migrated into the lumen, causing the occlusive state. We believe that a different kind of mesh, with a different type of fixation (such as absorbable tacks, transcutaneous stitch, or mechanical tacks without sharp components) would have obviated mesh migration.

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