Case report

Symptomatic attachment of appendix vermiformis following a plug inguinal hernia repair

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SUMMARY

We describe a case of attachment of an appendix vermiformis following an inguinal hernia plug repair according to Rutkow and Robbins. A 62-year-old man presented at our outpatient clinic with a progressive sensation of tightness in the right groin area, painful urge of miction and long-lasting nausea with abdominal discomfort. During an open groin exploration, the appendix was found attached to an intraperitoneally located plug. The appendix and plug were removed with an uneventful recovery. During follow-up, the patient was free of groin pain and miction had normalised. Surprisingly, his long-lasting nausea and abdominal discomfort had disappeared as well.

nerve. It was unclear whether a wrinkled mesh contributed to the pain.

TREATMENT

The patient consented to an operative exploration of the right groin. Intraoperatively, the ilioinguinal and the genital branch of the genitofemoral nerve were encased by the plug. A double neurectomy was executed in combination with a partial mesectomy and funiculolysis. Deeper portions of the mesh were left in situ to prevent a recurrent hernia. At the postoperative outpatient control, the patient was pain free.

BACKGROUND

If a patient presents with postherniorrhaphy visceral complaints, migration of meshes or plugs should be considered. Moreover, this case illustrates a potential phenomenon of referred visceral pain caused by a fixed appendix vermiformis.

CASE PRESENTATION

In 2010, a 62-year-old man with a history of a right upper lobectomy for lung cancer visited our outpatient clinic with severe groin pain. Ten years earlier, a right inguinal hernia had been repaired by a mesh plug according to the Rutkow-Robbins repair procedure. In this technique, a polypropylene plug is positioned in the internal inguinal ring. In 2008, the patient began to experience a progressively painful burning sensation in the right groin area and at the inner part of his upper leg. Dysejaculation, painful erections and transient electric sensations (paraesthesia) accompanied this pain syndrome that was diagnosed as chronic inguinal postoperative pain (CPIP). Imaging, including ultrasound and CT-scan, did not demonstrate any abnormalities explaining the pain.

INVESTIGATIONS

During physical examination, altered right-sided scrotal skin sensibility and a local, excessively painful pinching (hyperalgesia) were demonstrated and a palpable lump in his right groin was identified. During palpation, a characteristic pain irradiated towards his upper leg. It was concluded that his CPIP consisted of a neuropathic pain syndrome due to entrapment of the ilioinguinal nerve and, possibly, the genital branch of the genitofemoral

OUTCOME AND FOLLOW-UP

Five years later, the patient again presented to our centre of excellence for abdominal wall and groin pain (SolviMáx) with a painful urge of miction, abdominal discomfort with nausea and a progressive sensation of tightness in the right groin area, that had developed over the last 2 years. He was convinced that he suffered from peptic ulcers although medication was of no avail. A previous gastroscopy did not reveal any abnormalities. Neither were groin skin neuropathic characteristics present nor was pinching of the skin painful. However, a small but painful lump was palpable deep within the groin area. A Valsalva manoeuvre was negative, suggesting absence of a recurrent hernia. A nociceptive mesh-related pain was diagnosed and a second exploration was executed. The palpable lump appeared to be the Rutkow-Robbins plug that was now positioned deeply, and mainly preperitoneally, in the inguinal canal. Following plug dissection, appendix vermiformis was found attached to the meshoma (figure 1). The plug was also firmly attached to bladder, spermatic cord and epigastric vessels. A mesectomy and an appendectomy were performed and the latter structures could be dissected without structural damage. Histopathological examination demonstrated a giant cell reaction in the presence of the foreign body and ingrowth into the submucosa of the appendix.

Postoperatively, the patient was successfully treated with antibiotics for a low grade wound infection. At the outpatient evaluation, the groin pain syndrome and foreign body feeling had disappeared and the patient was very satisfied. Surprisingly, he spontaneously reported that his painful urge and nausea with abdominal discomfort were completely gone.

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Figure 1 Intraoperative views of the appendix vermiformis firmly attached to Rutkow-Robbins plug that was previously used for an inguinal hernia repair. The left forceps are holding the bladder.

DISCUSSION

Inguinal hernia repair is one of the most frequently performed surgical procedures worldwide (approximately 20 million repairs a year).¹ Pooled incidences of CPIP following open mesh-based techniques are higher (11% to 17%)^{2–5} compared with chronic pain following laparoendoscopic repairs (6% to 12%).^{5, 6} It is estimated that some 2 to 6% of inguinal hernia repairs result in significant limitations in social and daily activities.^{6, 7}

The role of imaging techniques in CPIP is limited. Ultrasonography can exclude an occult hernia recurrence.⁸ A CT or MRI scan may be used to diagnose a meshoma. However, the attending radiologist must be familiar with these types of images. If not, meshomas are often interpreted as non-specific postsurgical changes, non-specific densities or lymph nodes.^{9, 10} Imaging is therefore only helpful in ruling out other pathologies. In the present case, a previous MRI may have demonstrated migration of the mesh towards the appendix.

In the year of 2017, the gold standard for inguinal hernia repair was still open or laparoscopic mesh repair, depending on resources and available expertise.⁴ Plug repairs are nowadays considered inferior since these techniques include the excessive use of foreign material, enter both posterior and anterior inguinal planes and result in additional costs.⁴ Furthermore, plugs have a greater tendency to migrate when compared with flat meshes.⁴ Migration of plugs is often due to inadequate fixation. It is therefore advised to fixate the plug with non-absorbable suture material.¹¹ A second cause of migration of prosthetic material is related to foreign body reaction.¹² These reactions may lead to erosion of the tissue surrounding the plug (or mesh, in a similar configuration called a meshoma). The grade of erosion depends highly on the biocompatibility of the material.^{12, 13} Other factors influencing this biocompatibility include the type of material, pore size and rigidity of the plug or mesh.¹³ Irrespective of the mechanism of erosion, invasion of plugs (or meshes) into the viscera of the gastrointestinal tract, urinary bladder or even vessels is a potentially devastating long-term complication. The present patient reported a painful urge of miction that was eventually due to his plug progressively invading the bladder. Although rare, previous cases of intestinal obstruction and/or perforation due to migration of meshes have been described.^{12, 14}

If postherniorrhaphy visceral complaints present a number of years after a mesh-based repair, migration of the prosthetic material compromising the viscera should be considered in the differential diagnosis. In the present case, the appendix was neither inflamed nor macroscopically altered during surgical exploration. Although a convincing appendicopathy was also macroscopically absent, external compression of the adjacent mesh may have resulted in some form of inflammatory reaction and pain¹⁵ or a neuromodulative response.¹⁶ In the present case it was hypothesised that the plug migrated from the inguinal canal into the peritoneal cavity and eventually adhered to the appendix. This process eventually resulted in abdominal discomfort and nausea via a reflex mechanism. This phenomenon is a type of central somatovisceral integration which can result in this specific type of referred visceral pain.¹⁷ These complaints may typically mimic stomach ache, although the pain is resistant to stomach-protecting medications as also reported by the patient. Such discomfort is a characteristic example of segmentally related complaint. Removal of the meshoma-appendix trigger continuously supporting this afferent input resulted in immediate relief from the visceral discomfort.

Learning points

- Migration and erosion of meshes and plugs are rare complications of inguinal hernia repair but may lead to severe complications. Early recognition may prevent perforations of the viscera.
- Postherniorrhaphy pain may be due to a less recognised phenomenon termed referred visceral pain. Physicians should consider this possible aetiology of referred pain.
- Mesh or plug removal is the appropriate surgical treatment once prosthetic material has migrated.

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