CASE REPORT

Femoral neuropathy following a psoas hitch vesicopexy

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SUMMARY

A 68-year-old man classified as III on the American Society of Anaesthesiologists (ASA) physical status classification system, with a high-grade papillary urothelial cell carcinoma of the left distal ureter, underwent open retroperitoneal distal ureterectomy followed by a ureteroneocystostomy with a vesicopsoas hitch. Postoperatively, the patient complained of left proximal lower limb weakness, severe pain and hypaesthesia of the ventral left thigh suggestive of femoral neuropathy. After excluding common causes for postsurgical pain, a surgical re-exploration was eventually performed during which the sutures used in the vesicopexy were removed, resulting in almost complete resolution of the symptoms. Electromyographic analysis 4 weeks after discharge confirmed the diagnosis of femoral neuropathy, most likely caused by the sutures used in the vesicopexy. This is a rare complication with major consequences for postoperative recovery.

BACKGROUND

A psoas hitch vesicopexy is used in ureteroneocystostomy after distal ureterectomy, mobilising the ipsilateral portion of the bladder cranially and hitching it on the psoas muscle, allowing for ureteral reimplantation and bridging of the removed distal ureter. During this procedure, the femoral nerve (inside the psoas muscle) and the genitofemoral nerve (positioned on the ventral side of the psoas muscle) are at potential risk of iatrogenic damage caused by the sutures used to hitch the bladder onto the psoas muscle.

This case is noteworthy because femoral neuropathy following a psoas hitch procedure is a rare complication and seldom reported.^{1–4} More importantly, the present case illustrates that postoperative pain that is disproportionate to the surgery performed, in combination with motor weakness and hypaesthesia, warrants further investigation and, if necessary, additional treatment.

CASE PRESENTATION

After an open left-sided distal ureterectomy due to high-grade papillary urothelial cell carcinoma, a 68-year-old American Society of Anaesthesiologist (ASA)-III male patient was admitted to the postanesthesia care unit (PACU) due to comorbidity.

This patient had a significant medical history of coronary artery and vascular disease, chronic obstructive pulmonary disease (COPD) classified as Global Initiative for Chronic Obstructive Lung

Disease (GOLD) stage 3 and long-term opium abuse. Medications of note included subcutaneously administered fraxiparine as thromboprophylaxis and methadone titrated as an opium substitute.

Under general anaesthesia (without locoregional anaesthesia) in the supine position, a standard Gibson incision was made one inch medial from the anterior superior iliac spine, lateral of the border of the rectus sheath and one inch cranial to the inguinal ligament. Subsequently, an uneventful open retroperitoneal distal ureterectomy followed by ureteroneocystostomy with psoas hitch vesicopexy was performed, using non-absorbable polyester fibre sutures (figure 1).

Shortly after admission to the PACU, the patient complained of severe stabbing pain, hypaesthesia and motor weakness of his left ventral upper leg, which increased on palpation, hip flexion, knee extension and exorotation of the leg. Preoperatively, the patient had not experienced any symptoms similar to these.

From the second postoperative day until the eighth day, left proximal lower limb weakness, pain and hypaesthesia on the ventral left thigh persisted. This hampered adequate mobilisation and potentially increased the risk of postoperative complications, such as pneumonia, in view of this patient's pulmonary condition (COPD GOLD III).

INVESTIGATIONS

On the fourth postoperative day, on physical neurological examination the patient scored 3/5 on the Medical Research Council (MRC) scale during functional testing of the quadriceps femoris muscle. Ultrasound imaging of the ventral thigh and inflammatory markers revealed no abnormalities. Before re-exploration, a CT scan was made to exclude psoas haematoma, abscess or foreign body; however, the scan showed no abnormalities. Several weeks later an electromyographic test was performed for re-exploration to establish whether there were any signs of denervation.

DIFFERENTIAL DIAGNOSIS

Postsurgical pain with concomitant hypaesthesia and motor weakness was suggestive of neuropathic pain caused by femoral neuropathy. Physical examination gave no indication of radiculopathy and ultrasound investigation showed no focal tissue trauma of the left upper leg. Moreover, the CT scan revealed no proximal interruption in the femoral nerve branches due to psoas haematoma, or to

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Figure 1 Schematic abdominal anatomy following the psoas hitch vesicopexy. A, external iliac artery; AA, dorsal aspect of abdominal aortic aneurysm outside fEVAR lumen; CIA, common iliac artery; PM, psoas muscle; U = ureter; V, external iliac vein; VC, vena cava.

retroperitoneal bleeding or foreign objects. Neither inflammatory markers nor CT scans were suggestive of a postoperative abscess (a condition rarely seen in the first postoperative days). The pattern of symptoms remained highly suggestive of femoral neuropathy. The most likely cause of this seemed to be the sutures used to hitch the bladder to the psoas muscle. Therefore, it was decided to re-explore the surgical site.

TREATMENT

Postoperatively the patient received oral paracetamol (4dd 1000mg), oral oxycodone immediate release (IR) (maximum 6dd 10mg) and oral methadone (2dd 10mg). In addition, to reduce opioid consumption, lidocaine was given intravenously (0.5 mg/kg/h for 12 hours) according to the hospital protocol.⁵ From the second to the eighth postoperative day, we used an incremental multimodal analgesic treatment regimen, targeting neuropathic pain and adding oral oxycodone slow release (2dd 10mg), oral pregabalin (2dd 75 mg) and intravenous ketamine (3mg/h) (in addition to the paracetamol, oxycodone IR and methadone). Despite the incremental multimodal analgesic treatment, the symptoms suggestive of neuropathy persisted, with a score on the Numeric Rating Scale (NRS) for pain of 7/10 on the third postoperative day, together with impaired mobilisation. Eventually, on the eighth postoperative day, the patient underwent surgical re-exploration. On gross visual inspection, the continuity of the femoral nerve appeared anatomically intact and all sutures used for the vesicopexy were removed.

OUTCOME AND FOLLOW-UP

Postoperatively after re-exploration, the patient was admitted to the PACU and received analgesic treatment (as preoperatively) with the exception of oxycodone which was temporarily substituted with intravenous fentanyl (50 mcg/h continuously and 15 mcg on demand with a lockout time of 20 min) directly postoperatively after re-exploration, on the NRS for pain the patient rated his pain as 4/10.

From the eighth until the 14th day after the initial surgical procedure, analgesic requirements decreased and both pain and muscle weakness showed a significant improvement, although

the hypaesthesia persisted. On the fifth day after re-exploration, the patient scored 5/5 on the MRC scale during functional testing of the quadriceps femoris muscle. The patient was discharged with paracetamol 4dd 1000mg, pregabalin 2dd 75 mg and oxycodone IR 6dd 10mg on demand. The electromyography performed 4 weeks after discharge showed denervation of the musculus rectus femoris and slight denervation of the musculus vastus medialis; this supports the diagnosis of femoral neuropathy and, in this case, was most likely caused by the sutures used in the vesicopexy. Although the symptoms improved, 4 months after the re-exploration, the patient still showed mild signs of left upper limb weakness.

DISCUSSION

A psoas hitch vesicopexy was first described in 1896 by Witzel.⁶ The procedure comprises mobilising the bladder cranially and anchoring it to the psoas major muscle tendon. The procedure is commonly performed following a distal ureterectomy and ureteroneocystostomy in order to establish a tension-free anastomosis and prevent kinking of the ureter. The femoral nerve is formed out of lumbar plexus branches L2-L4 and is formed inside the psoas major muscle. The femoral motor nerves innervate the anterior thigh muscles, hip flexors and knee extensors. The somatosensory nerves (or rami cutanei anteriores) supply the skin of the anterior and medial thigh.⁷ After abdominopelvic surgery, femoral neuropathy can be caused by mechanical compression due to haematoma, abscess, prolonged lithotomy position, pressure from surgical retractors or, as in the present case, by injury of the nerve caused by the sutures used to hitch the bladder to the psoas major muscle.^{4,8}

We were able to obtain full-text articles^{1,9,10} describing four adult patients in whom electromyography confirmed femoral neuropathy following a psoas hitch vesicopexy. Of these patients, three were treated conservatively and the symptoms resolved completely after 4 months up to 1 year. In one patient, re-exploration was performed and sutures surrounding the femoral nerve were removed, resulting in complete recovery from the symptoms. Although no time frame was mentioned, the authors suggested that this latter recovery was also faster.

The therapeutic steps to be taken when suspecting femoral neuropathy after psoas hitch vesicopexy are based on a few case reports only. The cases that were reported suggested full recovery after conservative treatment; however, we suggest that individual patient factors should be taken into consideration in the decision to re-explore surgically when femoral neuropathy is suspected. The patient in the present case was considered to gain more benefit from re-exploration, since escalating multimodal analgesic treatment targeting neuropathic pain was unsuccessful. Furthermore, neuropathic pain and motor weakness impeded his mobilisation, increasing the chance of postoperative pulmonary complications related to immobility.

Femoral neuropathy is a rare complication after a psoas hitch procedure. Based on similar cases, it seems advisable to use absorbable sutures, so that potential nerve damage is only temporary⁸ and will not require re-exploration. It is also recommended to anchor the bladder with superficial sutures to prevent nerve damage.^{9,11} Re-exploration is worth considering in a select group of patients; for example, those with pulmonary disease, those at high risk of thrombosis and in the frail elderly.^{12,13} These patients benefit from early mobilisation, thereby reducing the risk of postoperative complications.

Learning points

- Adequate perioperative care requires detailed knowledge of surgical procedures and potential complications.
- Postoperative pain which is disproportionate to the preceding surgical trauma, especially if accompanied by other symptoms such as sensory abnormalities and/or motor weakness, warrants adequate analgesia, further investigation, and treatment as indicated.
- Femoral neuropathy after psoas hitch vesicopexy is a rare complication but should be identified as early as possible since impaired mobilisation due to severe postsurgical pain can have considerable impact on postoperative recovery.
- Re-exploration is worth considering in patients with pulmonary disease, those at high risk of thrombosis and in the frail elderly, all of whom benefit from early mobilisation.

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