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Case Report

Surgery Section

Laparoscopic Excision of Retroperitoneal Schwannoma

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ABSTRACT

Schwannomas are tumours that arise from the myelin sheath of the nerves. A very unusual location for schwannoma is the retro peritoneal areas (less than 2%). We present herewith a patient who had a 4x5cm Schwannoma arising from the nerve root of L2 on the right side, which presented as a lump in the psoas major muscle. This was treated by total laparoscopic excision after splitting open the psoas major. In the published english medical literature we could find only 16 cases of laparoscopic resection of retroperitoneal schwannoma and we believe ours to be the first case that was done through a psoas muscle split technique. Technical and histopathological details are discussed elaborately in this article.

Keywords: Laparoscopy, Psoas muscle, Retroperitoneum, Schwannoma

CASE REPORT

A 30-year-old male presented at our hospital with pain in the front of the right thigh, for which he had undergone a series of investigations by the neurologists. MRI [Table/Fig-1] showed a large lump within the right psoas muscle, in close relationship to L2 nerve root, and at a level that was 2cm below the lower pole of the right kidney. There were areas of degeneration in the central aspect of the tumour, which showed medial intracanalicular extension along the root of L2. The radiological appearance was highly suggestive of schwannoma with an extension to L2 nerve root. The anatomical position of the schwannoma was intra-psoas. After detailed discussion with the patient about a possible need of open surgery and probability of injury to the lumbar sacral plexus in close relation to the tumour, we proceeded with laparoscopic surgery

Technique

Patient was placed in supine position with legs split, surgeon stood between the legs of the patient and the camera person was to the left side of the surgeon, first assistant to the right side. We decided to proceed with an intraperitoneal approach to the retroperitoneum, with medial colonic reflection. Initially it was accessed through the suprapubic port with the left hand working port in the right iliac fossa and the right hand working port in the left iliac fossa, augmented by a 10mm port through the umbilicus that was used initially for right hand working, and was later used for the telescope.

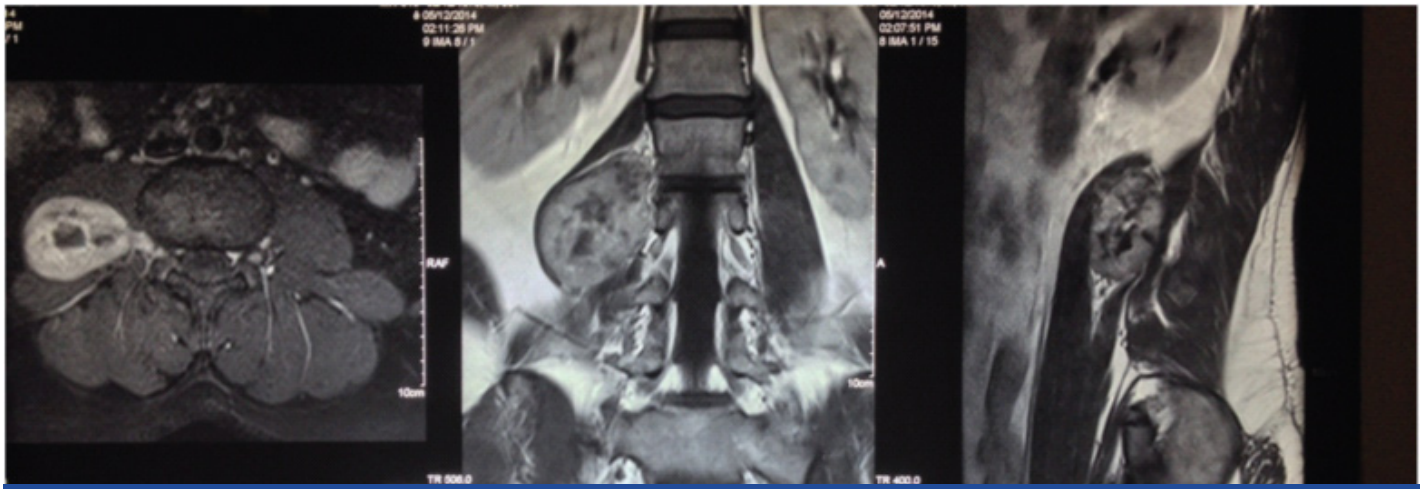
Initially the terminal ileum, the appendix, and the caecum were mobilized and lifted off the retroperitoneum. Then the port in the left iliac fossa was used to grasp these structures and reflect them medially and right hand working port through the umbilicus was used to continue the right paracolic dissection upto to the hepatic flexure and then to turn medially in order to expose the complete retroperitoneum [Table/Fig-2].

The anterior surface of the Gerota's fascia was completely exposed upto the level of the adrenal gland. The right ureter was identified and traced throughout its course [Table/Fig-3].

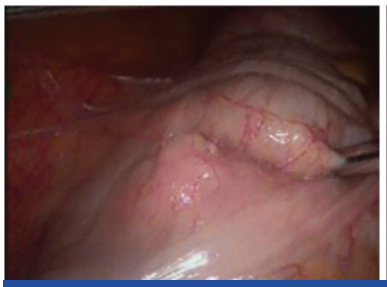
Progressive medial mobilization of the right colon allowed us to identify and preserve the duodenum and the complete Inferia Vena Cava (IVC). At this stage the psoas and the ilio-psoas tendon were both seen clearly. By correlation with the MRI we were able to then do a psoas split (a longitudinal 5cm muscle split of the psoas major lateral to genito-femoral nerve which was identified and preserved).

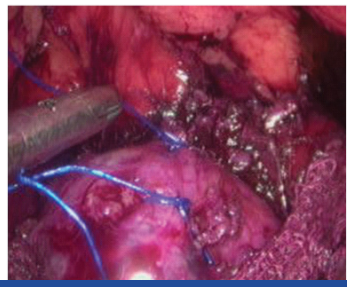
Wide longitudinal splitting of psoas major helps to expose the anterior surface of the capsule of the tumour [Table/Fig-4]. By careful dissection just outside the capsule, and by coagulating and dividing all the feeding vessels to and from the tumour, a plane was developed all around. We found the suture traction technique to be useful, and would like to recommend it too. Sutures were taken on the capsule of the tumour with 2-0 polypropolene which were held with the needle holder for retraction to expose further the surface and edges of the tumour [Table/Fig-5].

The medial dissection was kept towards the end as the MRI had shown some intracanalicular extension. After the lateral superior inferior and deep dissection had been completed, suction dissection was performed and the tumour was gently eased out of its intracanalicular extension. After the tumour was completely

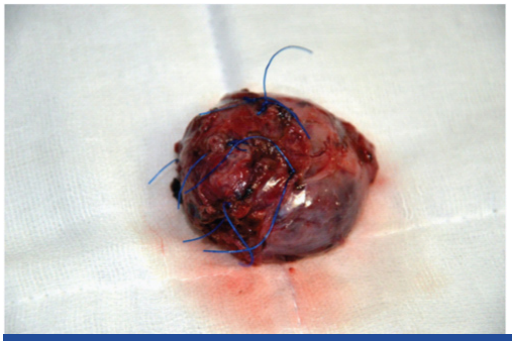
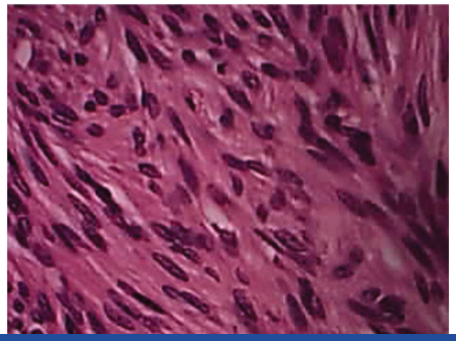
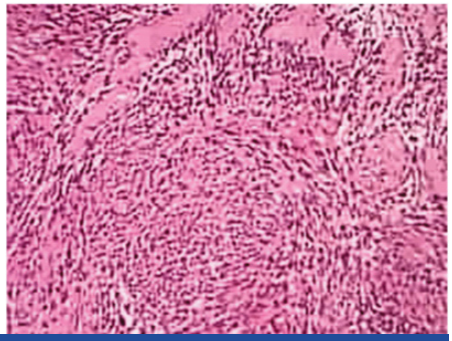


[Table/Fig-1]: MRI showing a large lump within the right psoas muscle, in close relationship to L2 nerve root, and at a level that was 2cm below the lower pole of the right kidney



[Table/Fig-2]: Medial reflection of the ascending colon **[Table/Fig-3]:** Dissection of right ureter **[Table/Fig-4]:** Psoas muscle split **[Table/Fig-5]:** Suture traction technique

[Table/Fig-6]: Specimen **[Table/Fig-7]:** Schwann cells **[Table/Fig-8]:** Veracoy bodies

dissected out it was placed in an indigenous plastic bag with a silk purse string and removed [Table/Fig-6] via a 3cm extension of the umbilical port, along with the gauze swabs that were put in for pressure haemostasis.

Operative time was 165 minutes, and the operating blood loss was about 20ml. After closed suction drainage of the area, the caecum and the ascending colon were repositioned on to the right side of the abdomen. The patient had a completely uneventful postoperative period, except for a little pain down the right thigh towards the lesser trochanter, possibly explicable by a little post operative ooze at the site of the psoas major. Histopathology showed capsulated lesion composed of schwann cells, fibroblasts, neural fibres with myxoid areas and the characteristic Veracoy bodies [Table/Fig-7,8].

DISCUSSION

Primary retroperitoneal schwannoma remain very rare nerve sheath tumours [1-3]. Otherwise known as Neurilemmomas, these arise from the myelin sheath of the nerves [4]. Schwannomas are diffusely S-100 positive, CD34 & CD117 negative, neuron specific enolase positive tumours that arise from the nerve sheath [5]. A variety of schwannoma often found retroperitoneally is the so called “Ancient” schwannoma that have much cystic degeneration due to growth outgrowing the blood supply. Characteristic histopathological change that are found, are the presence of spindle shape cells with the myxoid background appearance, with areas of dense cellular infiltration (Antoni A) and less cells and more abundant myxoid cytoplasm (Antoni B) [3,4].

Schwannomas in the retroperitoneum are often malignant (0.3 to 3.2%). Here, they pose certain special difficulties, especially due to their close relationship to great vessels and to the bones (transverse processes of the vertebras [6-9]. Compared to the usual locations in the flexor aspect of the arm and the appendicular skeleton, retroperitoneal schwannomas have a slightly higher incidence of malignancy. Laparoscopic excision of schwannomas was once deprecated against, on the grounds of possible injuries to surrounding structures. But better optics and increasing skills of tissue handling have rendered this once difficult task much simpler, and few published reports are available of laparoscopic excision [2,3,8-12].

Review of the literature showed no report of intra-psoas schwannoma that was taken out laparoscopically [13-17]. We found that the following steps were critical to a successful laparoscopic outcome: (1) Anterior approach with right colonic mobilization to the medial side. This allowed us to expose the ureter and the genito-fermoral nerve, which we traced back to its roots. This permitted us to identify the upper medial tip of the tumour with its intracanlicuar extension, (2) Looping the right ureter and the genito-femoral nerve permitted us to operate on the fibers of the psoas and reach the tumour, (3) The 5cm psoas spilt allowed us to reach the capsule of the schwannoma. The distracted fibers were later closed with interrupted suturesm, (4) Multiple sutures with polypropylene, on the capsule of the tumour were grasped sequentially by the needle holder. The resultant traction opened up a relatively avascular plane close to the capsule so that the dissection was proceeded with, and the retroperitoneal veins were undisturbed. The combination of all these factors engendered an excellent clinical outcome.

CONCLUSION

This paper has been published with two objectives. The first is to reiterate the trend of using the laparoscopic approach to tackle retroperitoneal tumours. The open approach is quite traumatic, and will gradually be used as a salvage option if minimal access surgery is unsuccessful. The second is to highlight two innovations that we have introduced in this operation, viz, the psoas spilt maneuver to reach the deeply located schwannoma, and the suture traction technique to dissect around the margin of the tumour. To our knowledge, these two techniques have not yet been described in the literature pertaining to excision of retroperitoneal tumours. Although a handful of papers have already established endoscopic schwannoma excision, we hope that with the help of advancing technologies, this is soon registered as the treatment of choice.

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