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ORIGINAL ARTICLE

Retroperitoneoscopic drainage of complicated psoas abscesses in patients with tuberculous lumbar spondylitis

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Abstract
Purpose Nowadays, endoscopic techniques are widely used in surgical procedures. Retroperitoneoscopy has been an extremely valuable tool for a wide variety of urologic disorders, whereas, it has limited use in orthopedic procedures.
Methods We performed retroperitoneoscopic drainage (in combination with medical treatment) of complicated psoas abscess on 12 patients with tuberculous spondylitis. All the procedures were done under general anesthesia and in the lateral decubitus position. Psoas abscess was evacuated during procedure, and postoperatively, drainage was continued through a large silastic tube. The definitive diagnosis and the treatment were made based on the results of culture-antibiogram and PCR testing.
Results Complete clinical and radiologic remission was observed in all patients in 3–6 months. The complication was not observed in any case postoperatively.
Conclusions Retroperitoneoscopic drainage of psoas abscesses gains advantages in terms of rapid recovery, minimal invasiveness, absence of radiation, and shorter hospital stay. This procedure can be used not only for cold abscesses but also for other pathologies of lumbar vertebral area.

Keywords Retroperitoneoscopy · Tuberculous spondylitis · Psoas abscess

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Introduction

Patients with tuberculous spondylitis (including cold abscess) can usually be treated with drug therapy alone [1], nevertheless, open surgical techniques are indicated under circumstances such as ineffective drug treatment or drug resistant tuberculosis, neurological deficit, spinal instability, complicated abscess formation, and discitis [2–5]. Endoscopic or image-guided spinal abscess drainages have superior advantages over the traditional surgical techniques [6]. Transpedicular abscess drainage can be also done in appropriate cases [7].

Retroperitoneoscopy is a reliable and widespread method for treating urological problems [8]. The fascia of the psoas muscle with posterior perirenal fascia is anatomically placed in the retroperitoneal space [9], so we had thought that retroperitoneoscopic drainage can be used instead of open surgical drainage for psoas abscesses. To our knowledge, only two publications regarding endoscopic drainage of psoas abscess were reported in the English literature [10, 11].

We report a series of 12 cases of complicated tuberculous psoas abscesses that were drained by retroperitoneoscopic technique from August 2007 to August 2010.

Materials and methods

All patients were evaluated by plain radiographs and MRI, preoperatively. Abscess location and the depth of invasion of abscess were determined by MRI. Before procedure, a general surgeon had evaluated all the patients to rule out an intraabdominal pathology causing psoas abscess. Definitive diagnosis was done microbiologically [by both culture and polymerase chain reaction (PCR)].

Patients with loss of excessive vertebral height or vertebral destruction were excluded from this study. These patients had undergone other major surgeries such as spinal fusion with/without instrumentation, laminectomy, and spinal cord decompression.

All the patients were discharged from the hospital with anti-tuberculosis medication. Postoperatively, patients were followed at intervals of 3 months. The loss of vertebral height, alignment of vertebra and its destruction were evaluated by roentgenograms. Recovery monitoring was performed by erythrocyte sedimentation rate, C-reactive protein level, and neurological status.

Technique

All the procedures were done in the lateral decubitus position under general anesthesia. Access to the retroperitoneal space was obtained with the open technique through a 1.5-cm subcostal incision under the extremity of the 12th rib and muscle divulsion up to the aponeurosis of the transverse muscle, which was then opened, and the fascia transversalis, identifying the prerenal fat. The creation of a working space in the retroperitoneum was performed by a balloon. A Hasson trocar was inserted in this space and fixed to the musculature with a purse-string suture in order to avoid air leakage and development of subcutaneous emphysema, and CO_2 insufflation was performed until reaching 12-mmHg tension. We used 0° optics and, when needed, the working space was completed using the optics under visualization. Two additional trocars were placed with the finger guidence; a 5-mm trocar on the hemiclavicular line just above the iliac spine and caudally to the optics port, and a 5- or 10-mm trocar posterior to the optics at the posterior axillary line, forming a triangle. When the psoas muscle and abscess become visible, a 2-cm incision was made in the fascia overlying the muscle, and pus was removed by suction and abscess cavity was irrigated with saline solution, after collecting 10 mL for microbial culture. A large silastic drain was placed into the abscess cavity and removed on second or third day, postoperatively.

Results

Patient characteristics and demographics are shown in Table 1. Prospectively, we performed a retroperitoneoscopic procedure in 12 patients. A patient with excessive hip flexion contracture complicated by psoas abscess has healed fully after retroperitoneoscopic drainage, and flexion contracture of the hip was rapidly improved with postoperative skin traction for 2–3 days (case 1) (Fig. 1a, b).

The rubber tube put into the operation site was removed after 2–3 days in all patients, except for one case with sepsis. This patient had also a sizeable abscess along the ipsilateral groin and popliteal fossa, and retroperitoneoscopic drainage was simultaneously performed with groin drainage by mini-incision anterior approach (case 2) (Fig. 2).

Table 1 Patient characteristics and demographics

Initials of patients	Age (years)	Sex	Side	Localization of abscess	Complication	Recovery
1. E.S.	21	F	Left	Retroperitoneum	Flexion contracture of hip	Full
2. H.K.	25	F	Right	Retroperitoneum, groin area and posterior of knee	Sepsis	Full
3. E.K.	68	F	Left	Retroperitoneum	L3–L4 discitis, left sciatalgica	Full
4. E.Ç.	15	F	Left	Retroperitoneum	L3 discitis	Full
5. A.S.	24	M	Right	Retroperitoneum, and Petit triangle	Right sciatalgica	Full
6. M.T.	74	F	Left	Retroperitoneum	Epidural abscess	Full
7. A.L.	63	F	Left	Retroperitoneum	Left sciatalgica	Full
8. S.T.	51	M	Right	Retroperitoneum and groin	Flexion contracture of hip	Full
9. M.S.	28	F	Left	Retroperitoneum	L2 discitis	Full
10. O.T.	27	F	Right	Retroperitoneum	Persistant low back pain	Full
11. E.B.	41	M	Left	Retroperitoneum	L2 discitis	Full
12. Z.A.	49	F	Left	Retroperitoneum	Epidural abscess	Full

F female, *M* male

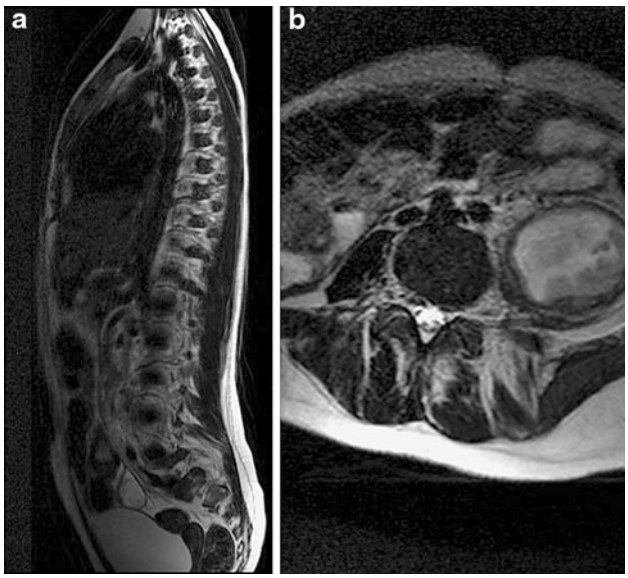

Fig. 1 **a** Sagittal MR image, a large psoas abscess, definitive diagnosis was made microbiologically. **b** At same patient, axial MRI image demonstrating a left cold psoas abscess

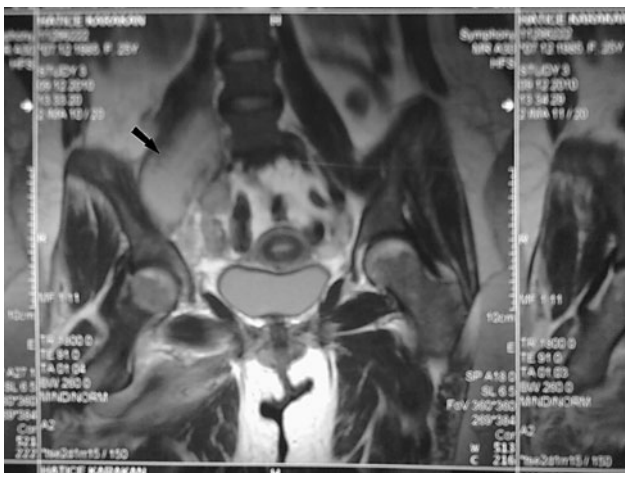

Fig. 2 Coronal MRI of the vertebra. A right large cold psoas abscess

In this patient, septic shock have dramatically improved at postoperative second day. A week later we removed her drainage tube.

In a patient that admitted to our clinic after failed needle aspiration, we successfully drained the abscess by retroperitoneoscopic procedure and achieved successful result (case 3) (Fig. 3a, b).

After treatment, all patients were became free of disease at a mean follow-up of 6 months. After 1–3 months the patients' clinical symptoms resolved, C-reactive protein (CRP) and sedimentation rate decreased to normal values. The periodic roentgenograms did not revealed any loss of height or destruction of vertebral bodies.

Discussion

The primary therapy of spinal tuberculous abscesses is done with appropriate anti-tuberculous drugs. If the treatment is neglected, serious complications can occur such as discitis [12], epidural abscess [13, 14], fatal outcome [15, 16], fistulization of the adjacent organs [17–19], and pediatric spondylolisthesis [20].

For a long time we had performed the open surgical treatment for psoas abscesses and we had achieved successful results. With the popularity of endoscopic procedures, 2 years ago, we initiated the retroperitoneoscopic procedure for only psoas abscesses in the tuberculous spondylitis.

We have successfully treated the 12 patients with retroperitoneoscopy. In only one patient, we performed open drainage for groin area in addition to retroperitoneoscopy and gained to successful result.

We also applied this technique in a patient after failed simple needle aspiration performed in another hospital, and the patient recovered fully. Based on our experience, in tuberculous spondylitis, abscesses can be purulent with high density. Therefore, the width of the mouth of the used

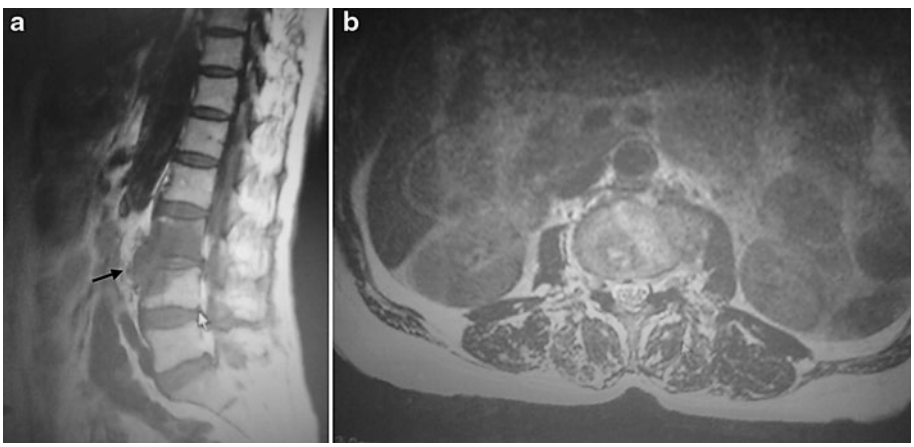

Fig. 3 **a** Sagittal MRI of the vertebral column. Discitis and osteomyelitis at L3 to L4 and paravertebral cold abscess. Indistinctness of the psoas muscle margin and enlarged psoas muscle and preserved vertebral height. **b** Axial MRI of the same patient. A large cold psoas abscess. Definitive diagnosis was made microbiologically

instrument for drainage should be large, and diameter of our used instrument was 5 mm.

In previous published articles, about retroperitoneoscopic procedures, various complications and failed attempts have been reported [3, 10, 21, 22]. In a series of 600 urological cases, the authors have reported complication rates of 5.3% including bleeding or hematoma, and conversion rates to open surgery of 4.6% [3]. In a orthopedic series of 20 cases, the three cases with bleeding and one case with peritoneum penetration has been reported [10]. However, with increasing experience the complication rates decrease [22].

We did not meet any complication in our cases, intraoperatively. Each of the patients was examined roentgenographically at least 6 months postoperatively, and there was no complication such as loss of height or destruction of the vertebral body.

Although the CT-guided drainage was reported to be used successfully in the drainage of psoas abscesses, the risk of high dose of radiation should be kept in mind [23].

We only used this technique for drainage of complicated lumbar psoas abscesses and we achieved the successful results.

Conclusion

Retroperitoneoscopic drainage of psoas abscesses gains advantages in terms of rapid recovery, minimally invasiveness, absence of radiation, and shorter hospital stay. We think that retroperitoneoscopic drainage of psoas abscess is a safe method in patients with tuberculous lomber spondylitis. In addition, we think that retroperitoneoscopic procedure can be used not only for cold abscesses, but also for other pathologies of lumbar vertebral area.

Conflict of interest None.

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