



En Bloc Resection of Common Iliac Artery, Iliac Vein, Ureter Along with Broad Ligament Sarcoma and Reconstruction of External Iliac Artery

Thingujam James¹ · Robbie George² · Saurabh Bhargava³ · R. S. Shruthi Dhevi¹ · Prasenjit Sutradhar³ · Jagadish Kaushik³ · Rohit Raghunath Ranade¹

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Introduction

The broad ligaments are made of two layers of mesothelial cells, which are folds of parietal peritoneum. These ligaments extend from pelvic wall to the uterus, fallopian tubes and ovaries. Between the two layers of these ligaments lie extraperitoneal tissue known as parametrium made up of connective tissue, smooth muscles, nerve and blood vessels.

Leiomyoma is perhaps the most common type of broad ligament tumour. Uterine leiomyosarcoma is an unusual tumour and aggressive in nature with a prevalence of 0.36 per 100,000 woman-years, accounting for almost 1% of all uterine malignancies [1].

The majority of these tumours originate from the uterus, but they can arise from any smooth muscle tissue. If the tumour is large enough, it will deform the pelvic anatomy, compressing the ureter resulting in hydronephrosis and moving uterus to the opposite side.

There are reports about the surgical approach to treatment of non-gynecological tumours which invade the iliac vessels, but there is paucity of data about Mullerian

tumours invading these structures and the option of surgical approach to such complex pelvic masses. In this case report, we present the feasibility of surgery by a multidisciplinary team approach which can improve the outcomes when one encounters such situations.

Case Summary

A 30-year-old mother of two came with complaints of pain in abdomen for 6 months and mass per abdomen for 3 months. She had history of right ureteric excision with BOARI flap repairs for ureteric strictures and right hydro-ureteronephrosis in 2017 due to ureteric calculi.

Ultrasound showed the presence of a large mass in right adnexa, following which exploratory laparotomy was done at another centre 2 months ago, and the patient was declared as inoperable in view of the mass completely encasing the vital structures.

On examination at our centre, a fixed solid hard mass of 15 × 15 cm was noted in right iliac fossa and hypogastrum. Bimanual examination revealed that the uterus was enlarged, deviated to the left iliac fossa due to the large solid hard mass in right adnexa, fullness of right and posterior fornices.

A contrast enhancing CT of abdomen and pelvis showed an enhancing soft tissue density mass lesion of 14 × 10 × 9 cm in the right hemipelvis infiltrating right distal ureter causing gross right hydronephrosis, raising a suspicion of broad ligament leiomyoma/leiomyosarcoma. There was suspected invasion of the right iliopsoas muscle with encasement of right iliac artery and vein. Tumour markers were normal. The case was discussed at multidisciplinary tumour board meeting, and recommendation was made for excision of the mass considering patient symptoms.

Laparotomy was performed by a midline vertical incision, a hard fixed mass of 15 × 14 cm was found occupying the

Thingujam James is a Trainee Fellowship; Robbie George is a Consultant Vascular Surgeon; Saurabh Bhargava is a Consultant Urologist; R. S. Shruthi Dhevi is a Trainee Fellowship; Prasenjit Sutradhar is a Consultant Vascular Surgeon; B. Jagadish Kaushik is a Consultant Urologist; Rohit Raghunath Ranade is a Consultant Gynaecological Oncology and Robotic Surgeon.

✉ Rohit Raghunath Ranade
ranade.rohit@gmail.com

¹ Department of Gynaecological Oncology, Mazumdar Shaw Medical Centre, Bangalore, India

² Department of Vascular and Endovascular Surgery, Mazumdar Shaw Medical Centre, Bangalore, India

³ Department of Urology, Mazumdar Shaw Medical Centre, Bangalore, India

right iliac fossa arising from right sided broad ligament, and mass was found to encase the right sided obturator nerve, common iliac artery, external iliac artery, internal iliac vessels and ureter (dilated). Uterus was normal in size, displaced laterally by the mass. Left fallopian tube and bilateral ovaries were normal.

To achieve an optimal oncological resection, the decision was made to excise the mass entirely along uterus, bilateral fallopian tube, right ovary and a portion of the abdominal wall. It was shaved off from the right iliac bone periosteum and sacral promontory, sacrificing the right common iliac artery, right iliac vein, right distal ureter, and right obturator nerve. Bilateral pelvic lymph node dissection was done. Right sided common iliac artery and distal external iliac artery were reconstructed with left superficial femoral vein and right sided ureteric reimplantation was done after mobilization of bladder over 6Fr DJ stent. Intra-abdominal drain of 24 Fr and Foleys catheter of 18 Fr was kept. Figure 1 shows pre-operative CECT scan findings, and Fig. 2 shows intraoperative pictures.

Post-operatively, thromboprophylaxis was achieved with low-molecular weight heparin and bilateral pneumatic compression device and later switched to class II stockings. Daily right lower limb vascular status was checked using hand Doppler. Intra-abdominal drain removed on post-operative day 5. Bladder catheterization was done for 21 days.

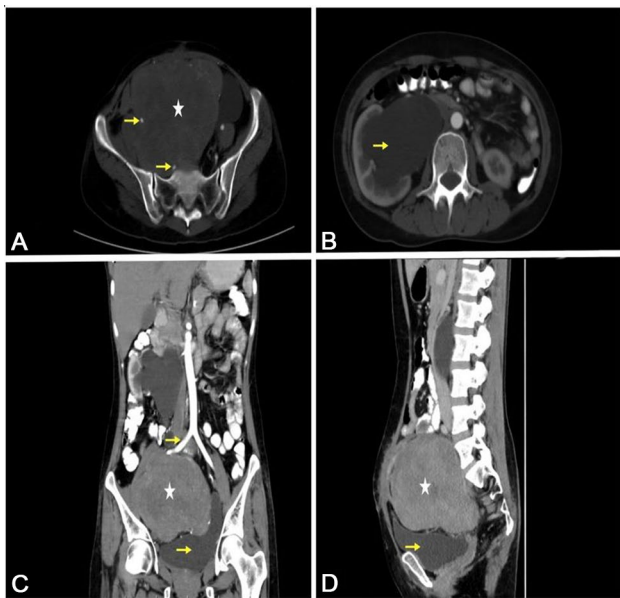


Fig. 1 **A** CECT axial view with white star demonstrates mass encasing the right external and yellow arrow demonstrating internal iliac artery. **B** Yellow arrow demonstrates the gross hydronephrosis due to mass effect. **C** In Coronal view, white star demonstrates mass pushing the bladder (yellow arrow) and invading the pelvis side wall. **D** In Sagittal view demonstrate, mass (white star) pushing Bladder (yellow arrow)

Postoperatively, she complained of pain and paresthesia in medial aspect right lower limb and showed mild adductor weakness in right lower limb, which improved after extensive physiotherapy.

Final histopathologic examination was probably suggestive low-grade leiomyosarcoma. Bilateral lymph node showed no evidence of metastasis. Further evaluation was done with IHC. Only CD117 testing was done, and it was negative.

Three months following her surgical resection, no recurrence was noted and she was on Type II compression stocking.

Discussion

Sarcomas are tumours with aggressive tumour biology which are less responsive to chemotherapy and radiation. Hence, surgical excision is the mainstay of treatment. The goal of modern surgical oncology is to provide complete oncological control and to minimise surgical morbidity in order to maintain physiological functions.

The vital structures, especially the iliac vessels that supply and drain the pelvic structures and lower limbs, are more at risk during a gynaecological oncologic procedure since large and complex tumours are often close to these vital structures. Previously, if a tumour infiltrated the iliac

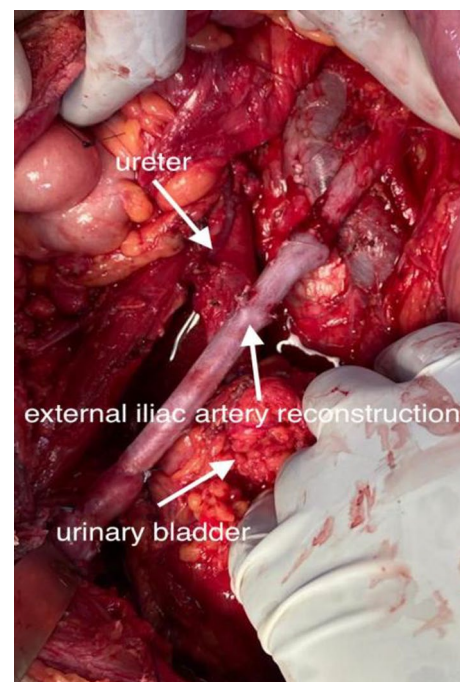


Fig. 2 Post-reconstruction of external iliac artery, reconstructed with left superficial femoral vein and reimplantation of ureter to urinary bladder

vessels, it was rendered inoperable due to the potential of surgical morbidity and mortality. With advances in surgical anatomy, surgeons have pushed the boundaries of surgical oncology skills, along with advanced imaging technology and specialised electrosurgical equipment. Pelvic tumours invading the pelvis vessels are no longer considered a surgical limitation; these vessels can now be excised en bloc to achieve a negative margin.

In our patient, en bloc resection of broad ligament mass, right iliac artery, right iliac vein, right ureter, and right obturator nerve was accomplished with reconstruction of the iliac artery with the left superficial femoral vein.

The question of whether the veins should be reconstructed using primary anastomosis or be simply ligated and left by itself remained a conundrum. In our case, because of the possibility of neovascularization and the development of collateral blood vessels to drain the lower extremity, we decided not to reconstruct the external iliac vein due to slow onset of venous occlusion and likelihood of adequate collateralization having already taken place.

Reconstruction of the vein increases the risk of thrombosis, leg oedema, graft-related infection while providing no additional benefit and at the increased risk of post-operative complications including amputations. Reconstruction of iliac artery using the synthetic graft is avoided as there is potential graft infection due to urinary contamination of the surgical bed due to ureter dissection and reimplantation. Infection of vascular conduit has severe consequences including risk of life, and the use of the SFV for reconstruction is well known, especially in relation to the treatment of infected aortic grafts, and it has the added benefit of being of sufficient size for reconstruction of major abdominal and pelvic vasculatures.

After major surgery of this nature, post-operative care in the form of adequate physiotherapy is essential. Despite of excision of obturator nerve in our patient, the lower limb pain, paresthesia and weakness were resolved following the intense physiotherapy [2, 3]. Long-term compression stocking is useful as she would remain at higher risk of DVT and venous hypertension due to nature of her disease and surgical procedures.

To conclude, patients of retroperitoneal soft tissue sarcoma with major blood vessels invasion can be offered surgical resection after explaining the high risk of post-operative morbidity, in well-equipped cancer centres with multidisciplinary team approach as this is the only curative therapy option [4].

Potential surgical morbidities that may impair functions and quality of life should be addressed and counselled with the patient and family prior to surgery. Our case demonstrates that successful resection of pelvis tumours involving the important structures and reconstruction can be accomplished with minimal morbidity to patients. A disease which was deemed as inoperable was successfully treated by multidisciplinary team approach, and this highlights benefits of such approach in complicated cases.

Declarations

Conflict of interest All authors declare that they have no conflict of interest.

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