***Case Report***

A Case Report of a Presacral Dermoid Cyst

**Abstract**

**Background**: Presacral or retro rectal dermoid cysts are rare congenital lesions arising from ectodermal remnants during embryogenesis. Due to their deep pelvic location and nonspecific symptoms, these lesions often pose diagnostic and surgical challenges. Case Presentation: We present a 21-year-old female with persistent lower back pain and constipation. Imaging revealed a large lobulated cystic lesion in the presacral region. The patient underwent complete surgical excision via an anterior transabdominal approach. Histopathology confirmed a dermoid cyst. Postoperative recovery was uneventful. Conclusion: Presacral dermoid cysts, though rare, should be considered in young adults with persistent pelvic symptoms. MRI is essential for preoperative planning. Surgical excision is curative and prevents complications such as infection or malignant transformation. Keywords: Presacral cyst, Dermoid cyst, Retro-rectal tumour, Anterior approach, MRI pelvis, Developmental cyst.

Keywords: Presacral cyst, Dermoid, Retro rectal, MRI, Surgical excision

**Introduction**

The presacral or retro-rectal space is a potential anatomical region bounded by the rectum anteriorly, sacrum posteriorly, peritoneal reflection superiorly, and the levator ani and coccygeus muscles inferiorly. It has clinical significance due to its complex embryological development and proximity to vital pelvic structures. Among these lesions, developmental cysts are most prevalent. These include epidermoid, enteric, tailgut, and dermoid cysts. Dermoid cysts, or mature cystic teratomas, are benign congenital anomalies that derive from ectodermal components and are characterized by the presence of skin adnexal structures such as sebaceous glands, sweat glands, and hair follicles within a squamous epithelial lining. Dermoid cysts grow slowly and often remain asymptomatic until they compress adjacent organs. Common symptoms include constipation, pelvic pain, or urinary disturbances, depending on the lesion's size and location. Although benign, complications such as infection, rupture, or malignant transformation have been reported, particularly in long-standing lesions. Imaging, especially MRI, is pivotal for diagnosing these lesions and for preoperative planning due to its superior soft-tissue resolution. This report describes a case of a large presacral dermoid cyst in a young woman, emphasizing diagnostic workup, surgical approach, and histopathological confirmation.

**Case Presentation**

A 21-year-old nulliparous woman presented to the surgical outpatient department with chronic lower back pain and constipation persisting for six months. The pain was dull, non-radiating, and exacerbated by sitting or straining during defecation. Systemic and genitourinary symptoms, including fever, weight loss, rectal bleeding, or urinary complaints, were absent. Menstrual cycles were normal. She had no comorbidities or history of gynaecological procedures.

**Clinical Examination:**

No significant findings were noted on general physical or systemic examination. Per abdominal examination revealed no masses or tenderness. Digital rectal examination identified a soft, ill-defined, non-pulsatile, compressible mass on the posterior rectal wall, approximately 4–5 cm from the anal verge.

**Laboratory Investigations:**

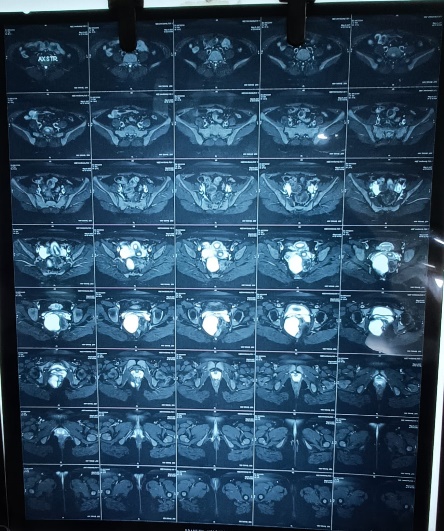
Routine haematological and biochemical tests were normal. Tumour markers including carcinoembryonic antigen (CEA), alpha-fetoprotein (AFP), and CA-125 were within reference limits.

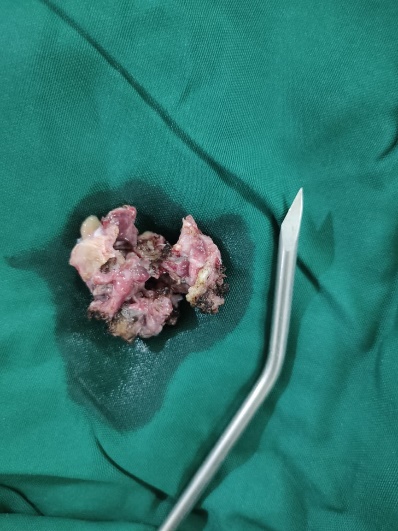
**Radiological Imaging:**

Pelvic MRI demonstrated a well-defined 75\*49\*55 mm lobulated cystic lesion with multiple septa in right pre-sacral and pre-coccygeal region extending into right vagino-rectal pouch (few of locules of lesion at its posterior aspect shows soft internal proteinaceous content) with extension suggest possibility of BENIGN CYSTIC LESION-possibility DERMOID CYST/PRE SACRAL CYSTIC TERATOMA more likely than Duplication cyst. The lesion is seen causing extrinsic compression over rectum on left side with preserved fat planes. The lesion is seen causing mild compression over vagina and cervix at anterior aspect with preserved fat planes. The lesion is seen causing mild extrinsic scalloping of anterior cortex of coccygeal vertebra without bone marrow oedema.

**Preoperative Preparation:**

Multidisciplinary planning was conducted involving colorectal surgery, anaesthesiology, and radiology. The lesion's dimensions and anatomical position favoured a transabdominal (anterior) approach for surgical excision.



**Figure 1.** (a) MRI T1-weighted image showing presacral lesion (b) Intraoperative view; (c) Excised presacral cyst;

**Surgical Procedure:**

Under general anaesthesia, a midline infraumbilical incision was made. Two stay sutures taken with broad ligament and uterus retracted anteriorly. After mobilizing the sigmoid colon laterally and rectum, the retro-rectal space was accessed after dissection of left and right meso-rectum. A lobulated cystic mass was visualized of 6\*6\*5 cm displacing the rectum anteriorly. The cyst was confirmed with per rectal examination and intrabdominal examination simultaneously. The cyst was aspirated to facilitate dissection. Adhesions to the levator ani and coccyx were carefully dissected to preserve surrounding structures. The cyst was completely excised without rupture. The rectal wall was intact. A pelvic drain was placed. Haemostasis achieved.

**Postoperative Course:**

The patient recovered uneventfully. Oral intake was resumed on day two, and the drain was removed on day four. She was discharged on postoperative day five. Follow-ups at one and three months showed no recurrence or complications.

**Histopathological Findings:**

Macroscopically, the cyst contained multiple greyish, brownish soft tissue structure. Microscopically, the cyst was lined by keratinizing stratified squamous epithelium. The underlying tissue show fibromuscular and fatty tissue with presence of acute on chronic inflammation. No dysplasia or malignancy was identified.

**Discussion**

Presacral dermoid cysts, despite their rarity, warrant consideration in the differential diagnosis of chronic pelvic or sacral symptoms. These lesions result from the incomplete regression of embryonic ectodermal tissues.

**Epidemiology and Classification**

Presacral tumours show a bimodal age distribution, most commonly in neonates and middle-aged women. Developmental cysts constitute approximately 60% of these lesions, with dermoid cysts being among the least common. Their clinical significance lies in their potential to grow, cause compressive symptoms, and, rarely, undergo malignant transformation.

Clinical Features The presentation is often nonspecific and depends on size and anatomical relationships. Symptoms include:

* Constipation, rectal fullness, or tenesmus.
* Pelvic or sacral pain due to nerve compression.
* Urinary retention or frequency.
* A palpable mass on digital rectal or gynaecological examination.
* Rarely, recurrent perianal abscess or fistula formation in case of secondary infection.

**Differential Diagnosis**

The differential diagnosis includes tailgut cysts, epidermoid cysts, anterior sacral meningocele, rectal duplication cysts, and chordomas. Tailgut cysts and dermoid cysts differ histologically and in malignant potential. Hence, definitive diagnosis requires histopathological confirmation.

**Imaging**

MRI is the imaging modality of choice due to its ability to delineate soft-tissue structures, fat components, and cystic septations. CT scanning is useful for detecting calcifications and bone involvement. Endorectal ultrasound and colonoscopy may be considered in select cases to evaluate rectal wall integrity.

**Surgical Management**

Definitive treatment involves complete surgical removal of the lesion. Incomplete resection risks recurrence, infection, or malignant transformation.

Approaches:

* **Posterior (trans sacral or Kraske) approach:** Indicated for tumours confined below the S3 vertebral level
* **Anterior (transabdominal):** Preferred for lesions above S3 or large masses.
* **Combined approach:** Employed in complex, recurrent, or multiloculated lesions.

**Posterior Approach:**

The presacral lesions were excised using a posterior trans-perineal (Kraske) approach, which is a standard method for accessing deep pelvic and retro-rectal space. The patient was placed in the prone jackknife position, with the buttocks retracted to optimize surgical exposure of the perineal region.

A midline or para-sacral incision was made, extending from the lower sacrum and coccyx to the anal verge. After skin and subcutaneous tissue dissection, the anococcygeal ligament was severed, allowing lateral retraction of the levator ani muscles and entry into the presacral space. In order to provide adequate visualization and working space, coccygectomy was performed in each case.

Meticulous and careful blunt and sharp dissection was carried out to safely separate the lesion from surrounding structures, particularly the rectum. Special attention was paid to avoid injury to adjacent pelvic organs and preserve anorectal function.

Following complete excision of the mass, the perineal defect was reconstructed, and closed suction drains were placed to minimize postoperative seroma or hematoma formation. The wound was closed in layers using absorbable sutures for deep tissue and non-absorbable sutures or staples for skin closure, as appropriate.

This approach provided excellent exposure of the presacral space and facilitated safe and complete excision of the lesions with minimal morbidity.

**COMPLICATIONS OF POSTERIOR APPROACH**

**1. Wound-Related Complications**

* **Wound infection:** Due to proximity to the anal canal and potential contamination.
* **Wound dehiscence:** Especially in patients with poor nutrition, obesity, or tension at closure.
* **Seroma/Hematoma formation:** Despite drainage, fluid collections may occur.
* **Perineal abscess:** Resulting from infection or residual fluid.

**2. Neurological and Functional Complications**

* **Damage to sacral nerve roots**: A serious complication that may cause dysfunction of bowel, bladder, or sexual activity.
* **Faecal incontinence or urgency:** Due to injury or traction on pelvic floor muscles or pudendal nerves.
* **Urinary retention:** Secondary to neural trauma or reflex inhibition.

**3. Structural and Organ Injury**

* **Rectal injury/perforation:** A recognized complication, particularly when the cyst is adherent to the rectum or dissection planes are unclear. Bladder or urethral injury**:** Rare but possible in deeply seated lesions.
* **Pelvic organ prolapse:** If the pelvic floor is significantly disrupted and not properly reconstructed.

**4. Other General Surgical Risks**

* **Bleeding:** Presacral venous plexus injury can cause significant intraoperative bleeding.
* **Deep vein thrombosis (DVT) or pulmonary embolism (PE):** Especially with prolonged prone positioning and pelvic surgery.
* **Prolonged wound healing or chronic pain:** Due to poor vascularity in the sacrococcygeal region.

**Long-Term Complications**

* **Recurrence of the lesion:** Especially in cases of incomplete excision or malignancy.
* **Chronic perineal pain**: May result from neuropathic injury or postoperative scarring..
* **Cosmetic or functional dissatisfaction:** Related to scarring, coccygectomy, or changes in sitting posture.

**ANTERIOR APPROACH**

The abdominal approach was selected in cases where the tumour was large and located above the S3 vertebral level, making access via the trans sacral route challenging. A midline lower abdominal incision was performed with the patient in the lithotomy position. Dissection proceeded into the retro rectal space based on the tumour's location. A critical step during mobilization was the careful preservation of the rectal vessels and mesorectum to avoid injury and associated complications. It was recommended that the presacral space be identified before attempting to separate the tumour from surrounding structures. This precaution helps minimize the risk of haemorrhage from the presacral venous plexus (PSVP), which is commonly injured during blind use of electrocautery. The choice of postoperative drainage was tailored according to intraoperative findings and wound characteristics.

**COMPLICATION OF ANTERIOR APPROACH**

1. **Injury to Adjacent Structures**: Due to the proximity of the tumour to pelvic organs, there is a risk of inadvertent injury to the rectum, ureters, and bladder, especially during deep dissection in the retro rectal space.
2. **Haemorrhage**: One of the most serious complications is bleeding from the **presacral venous plexus (PSVP)**. These thin-walled, valveless veins can be easily injured, particularly when using electrocautery blindly. Uncontrolled bleeding can be life-threatening and difficult to manage intraoperatively.
3. **Infection and Wound Complications**: The large abdominal incision and deep pelvic dissection increase the risk of postoperative wound infection, pelvic abscess, or delayed wound healing. Adequate drainage and sterile technique are essential to minimize these risks.
4. **Bowel Dysfunction**: Temporary or, in rare cases, permanent bowel disturbances such as constipation, incontinence, or tenesmus may result from injury to pelvic autonomic nerves or prolonged manipulation near the rectum.
5. **Urinary Dysfunction**: Autonomic nerve injury may also lead to urinary retention or incontinence, especially if the hypogastric plexus is affected during dissection.
6. **Adhesion Formation**: Intraperitoneal dissection can lead to postoperative adhesions, which may cause bowel obstruction or chronic pelvic pain.
7. **Recurrence**: Incomplete excision of the tumour due to limited visualization or difficult dissection planes may lead to recurrence, necessitating further surgical intervention.
8. **Prolonged Recovery**: Compared to minimally invasive or posterior approaches, the abdominal route generally involves longer hospital stays and recovery periods.

**Combined approach**

In cases where the tumour extends both below the S3 level and above its cephalic margin, neither the trans-sacral nor the trans-abdominal approach alone provides sufficient access for complete excision. In such scenarios, a combined abdomino-sacral approach is warranted to ensure radical resection. Benign presacral tumours typically achieve clinical cure with complete surgical excision. However, for malignant lesions, adjuvant radiotherapy is often necessary to reduce the risk of local recurrence and improve outcomes.

Regardless of the surgical approach employed, **intraoperative digital rectal examination** is crucial throughout the dissection to avoid inadvertent rectal injury. For trans-sacral and combined approaches, **preservation of at least one S3 nerve root** and **all S1–S2 nerve roots** is essential to maintain pelvic floor function and prevent postoperative neurological deficits.

Complication of this approach

The combined abdomino-sacral approach provides optimal exposure for large or high-lying presacral tumours extending above the S3 level. However, it is associated with increased complexity and risk of complications due to the involvement of both anterior and posterior pelvic dissections:

1. **Rectal Injury**: The risk of rectal perforation or laceration is higher due to dissection around the rectum from both anterior and posterior planes. Intraoperative digital rectal examination is essential to monitor rectal wall integrity during tumour mobilization.
2. **Presacral Haemorrhage**: Bleeding from the presacral venous plexus is a significant complication, particularly when dissection is performed near the sacral surface. Haemostasis is often challenging due to the fragile nature of these veins and their proximity to the tumour.
3. **Neurological Deficits**: Injury to sacral nerve roots (especially S1–S3) can result in motor or sensory deficits of the lower limbs, perineum, or pelvic floor. Maintaining the integrity of at least one S3 nerve root and all S1–S2 roots is critical in minimizing the risk of functional deficits.
4. **Pelvic Organ Dysfunction**: Due to the proximity of the dissection to autonomic nerves, patients may develop:
   * **Urinary dysfunction** (retention or incontinence)
   * **Faecal incontinence or constipation**
   * **Sexual dysfunction** (e.g., erectile dysfunction in males or dyspareunia in females)
5. **Wound Complications**: The dual incision sites (abdominal and sacral) increase the risk of wound infection, seroma, dehiscence, or delayed healing. The sacral wound is particularly susceptible due to poor vascular supply and proximity to the anus.
6. **Pelvic Abscess and Deep Infection**: Extended pelvic dissection increases the risk of abscess formation, especially if the rectum is injured or if tumour contents spill during removal.
7. **Cerebrospinal Fluid (CSF) Leak**: If the dissection inadvertently enters the spinal canal or damages the thecal sac (especially in tumours adherent to dura), CSF leak and meningitis may occur, requiring repair or lumbar drainage.
8. **Tumour Seeding or Recurrence**: In cases of malignant or ruptured cystic lesions (e.g., dermoid or tailgut cysts), there is a risk of tumour cell seeding or recurrence, particularly if en-bloc resection is not achieved.
9. **Prolonged Recovery and Postoperative Pain**: Due to the extensive dissection and involvement of deep pelvic structures, patients often experience more postoperative pain and longer recovery times than with single-approach procedures.

In the present case, the anterior approach facilitated complete excision with minimal morbidity. No intraoperative rupture occurred, thus reducing recurrence risk.

Histology and Prognosis Dermoid cysts are lined by stratified squamous epithelium with adnexal components. Although rare (~1–2%), malignant transformation to squamous cell carcinoma can occur, especially in long-standing or large lesions. Complete excision typically results in excellent prognosis.

**Table 1: Comparison of Surgical Approaches for Presacral Masses**

| **Parameter** | **Anterior Approach** | **Posterior Approach** | **Combined Approach** |
| --- | --- | --- | --- |
| **Access Route** | Transabdominal (open or laparoscopic) | Trans-sacral (Kraske), trans-perineal, or para sacral | Both transabdominal and trans-sacral |
| **Indication** | High-lying tumours (above S3) | Low-lying tumours (below S3) | Tumours spanning above and below S3 level |
| **Patient Positioning** | Supine | Prone or jackknife position | Supine first, then repositioned prone (or vice versa) |
| **Advantages** | - Better visualization of pelvic organs  - Allows control of major vessels | - Direct access to lower presacral space  - Avoids intraperitoneal dissection | - Complete exposure for large/complex tumours |
| **Disadvantages** | - Limited access to lower sacrum  - Risk of bowel injury | - Limited view of superior margins  - Potential for rectal injury | - Increased operative time  - Requires position change  - More invasive |
| **Common Complications** | - Bowel injury  - Bleeding  - Ureteral injury | - Wound infection  - Rectal injury  - Sacral nerve damage | - Combination of above risks |
| **Use of Intraoperative DRE** | Yes – to assess tumour proximity to rectum | Yes – to protect rectum during dissection | Mandatory in both stages |
| **Extent of Tumour Resectability** | Partial or complete (depends on tumour location) | Often complete for low-lying tumours | Allows for radical excision of extensive lesions |
| **Postoperative Recovery** | May involve ileus or prolonged hospital stay | Faster recovery, less visceral manipulation | Longer recovery, higher risk of complications |
| **Preferred for** | Malignant or large high pelvic tumours | Benign, low presacral tumours like dermoid/epidermoid cysts | Large, dumbbell-shaped, or complex tumours extending across S3 level |

**Conclusion**

Presacral dermoid cysts are rare developmental lesions that may cause significant symptoms due to mass effect. Magnetic Resonance Imaging (MRI) is the imaging modality of choice for detailed assessment and surgical planning in presacral tumours. Surgical excision is curative and prevents future complications. Awareness of differential diagnoses and individualized surgical strategies are key to optimal outcomes.

Consent: Written informed consent obtained from the patient

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