Presacral solid tumors

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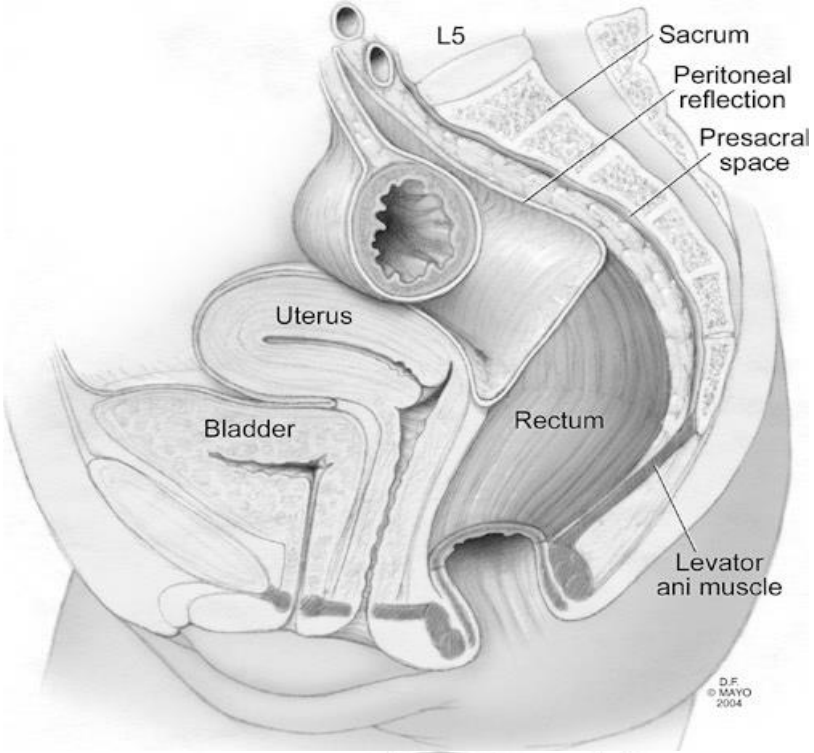
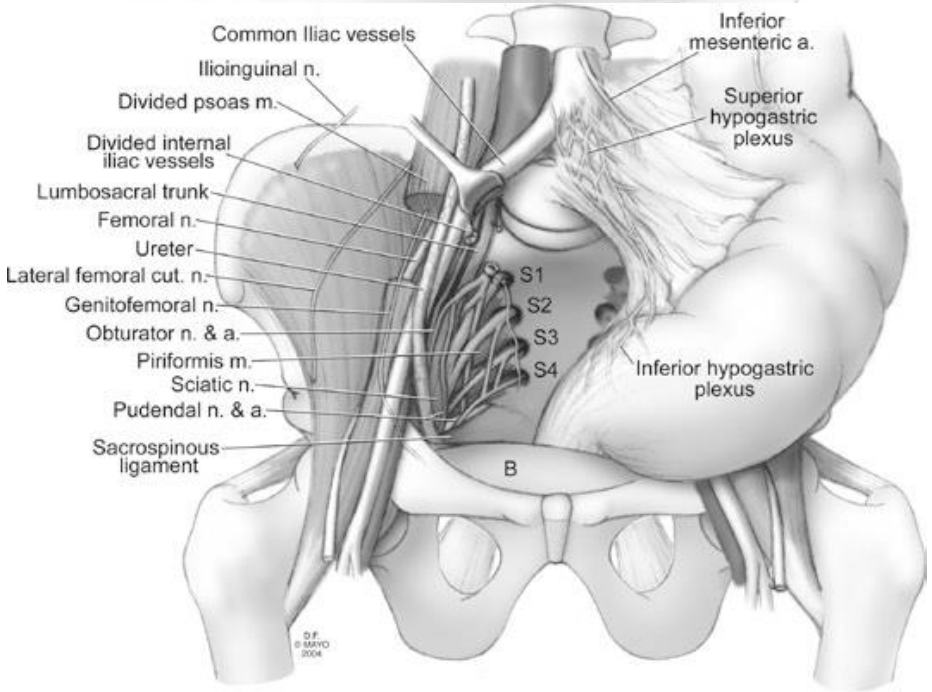
Introduction

- Arise in the space between sacrum and mesorectum
- This space contains tissues derived from **all three germ cell layers** and from which presacral tumors may arise
- **Categorized as:**
  - **Congenital or acquired**
  - **Benign or malignant**
  - **Cystic, solid or heterogeneous**
- **Rare** (1 in 40,000 /60,0000 admissions)
- Commonly **asymptomatic**

Anatomic background

- **Anteriorly:**
  Mesorectum
- **Posteriorly:**
  Anterior table of the sacrum
- **Inferiorly:**
  levator muscles
- **Laterally:**
  lumbosacral plexus, ureters, and iliac vessels





Content

- **Loose connective tissue**
- **Middle sacral artery**
- **Superior hemorrhoidal vessels**
- **Branches of sympathetic and parasympathetic nerves**

Presacral tumors and its challenges

- The sacral nerve roots injury leads to:
  - Defecatory
  - Urological **Dysfunction**
  - Sexual
- **Unilateral S1-S5** ≈ 90% normal bowel and bladder function
- **Bilateral S4-S5** : 100% normal bowel function , 70% normal bladder function
- **Bilateral S3-S5** : 40% normal bowel function, 25% normal bladder function
- **Bilateral S2-S5**: complete loss of bowel and bladder function
- **S1**: foot drop
- **High sacrectomy > ½ S1 vertebral body** removed : pelvic instability

Todd LT Jr, Yaszemski MJ, Currier BL, Fuchs B, Kim CW, Sim FH. Bowel and bladder function after major sacral resection. Clin Orthop Relat Res. 2002;397:36–9.

Mayo classification of presacral tumors

	Benign	Malignant
Congenital	Developmental cysts • Dermoid, epidermoid • Enterogenous (rectal duplication) • Tailgut (cystic hamartomas /mucous Secreting) • Teratoma	Malignant developmental Cyst Teratocarcinoma
	Anterior sacral meningocele	**Chordoma**
	Adrenal rest tumor	Germ cell tumor
Neurogenic 10%	Ganglioneuroma	Ependymoma
	Neurofibroma	Ganglioneuroblastoma
	Schwannoma (most common benign)	Malignant schwannoma
		Neuroblastoma
		Peripheral nerve sheath tumors (MC malignant)

	Benign	Malignant
Osseous 10% Locally destructive Commonly metastatic	Aneurysmal bone cyst	Chondrosarcoma
	Giant cell tumor	Ewing's sarcoma
	Osteoblastoma	Myeloma
	Simple bone cyst	Osteogenic sarcoma
		Spindle cell sarcoma
Miscellaneous	Lipoma	Liposarcoma
	Fibroma	Fibrosarcoma
	Leiomyoma	Leiomyosarcoma
	Desmoid	Malignant desmoid
	Benign GIST	Malignant GIST
	Hemangioma	

Clinical presentation

- Vague and ill defined
- Discovered incidentally on routine pelvic or rectal examination
- Pelvic or low back pain, constipation, a palpable mass or obstructive type symptoms.
- Classically, pain is aggravated by sitting and ameliorated by standing or walking
- Urinary or fecal incontinence and sexual dysfunction.
- Persistent perianal discharge.

Work up

- **Focused physical examination:**
  - DRE (rectal mucosa texture / mass)
  - Relation to coccyx
  - Postanal dimple
  - Neurological examination
- **Endorectal ultrasound** to assess relation to rectal muscle wall (replaced By MRI)
- **MRI (Gold standard)**
  - Relationship of the tumor to adjacent structures
  - Best assessment of internal composition and morphology of the lesion (solid , cystic or heterogenous/ Benign or Malignant)
  - Determining surgical approach
- **Flexible sigmoidoscopy** to exclude a lesion of mucosal origin and assess for intra-luminal extension of the presacral mass.
- **Percutaneous biopsy** (controversial)

Preoperative biopsy

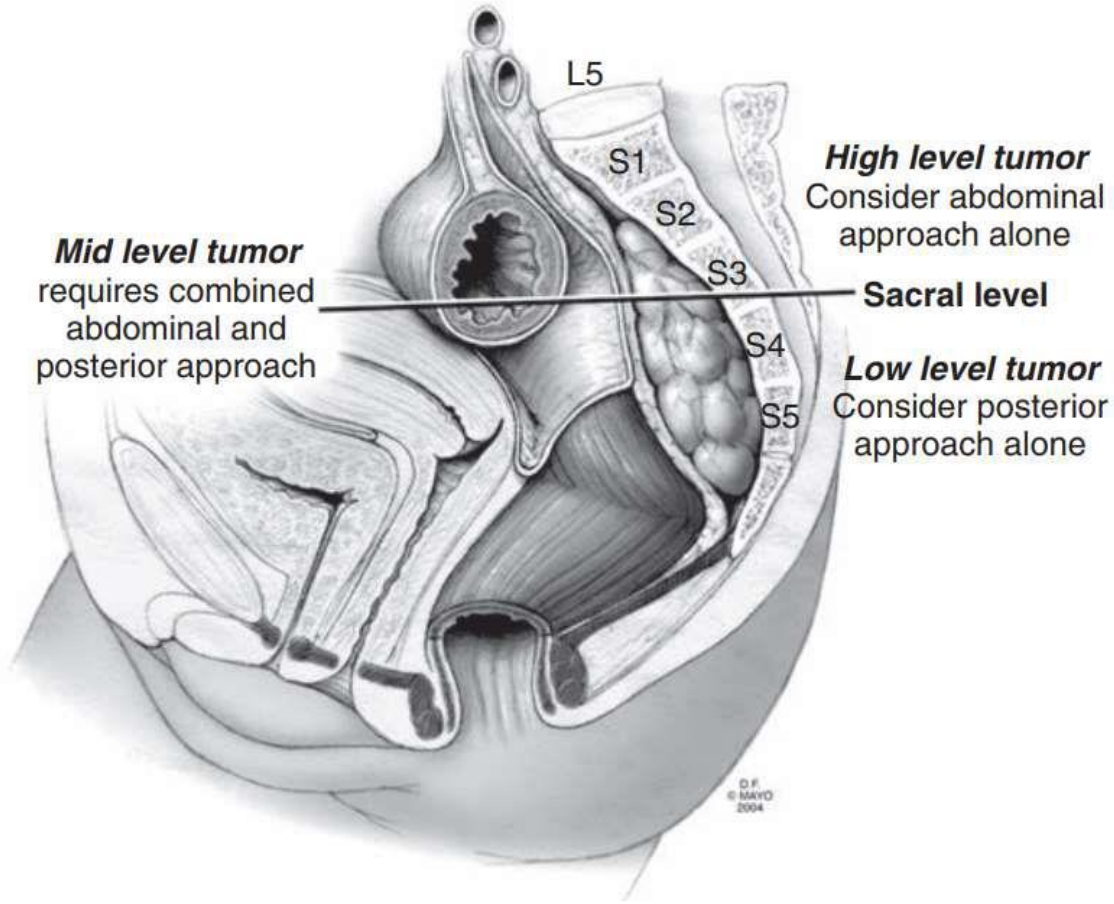
- **Against** :
  - MR technology : adequate assessment of likelihood of malignancy
  - May lead to tumor seeding or infectious complications

- **With : solid and heterogenous**
  - potential impact upon the extent of **operative approach**,
  - Neoadjuvant therapy (**Ewing sarcoma, osteogenic sarcoma, and neurofibrosarcoma**)
  - Better counsel the patient prior to Surgery.

Multidisciplinary team

- **Colorectal** Surgeon
- **Orthopedic Oncologic** Surgeon
- **Spine** Surgeon
- **Vascular** Surgeon
- **Plastic** Surgeon
- **Radiologist**
- **Medical oncologist**
- **Radiation oncologist**
- **Anesthesiologist**
- **Rehabilitation therapist**

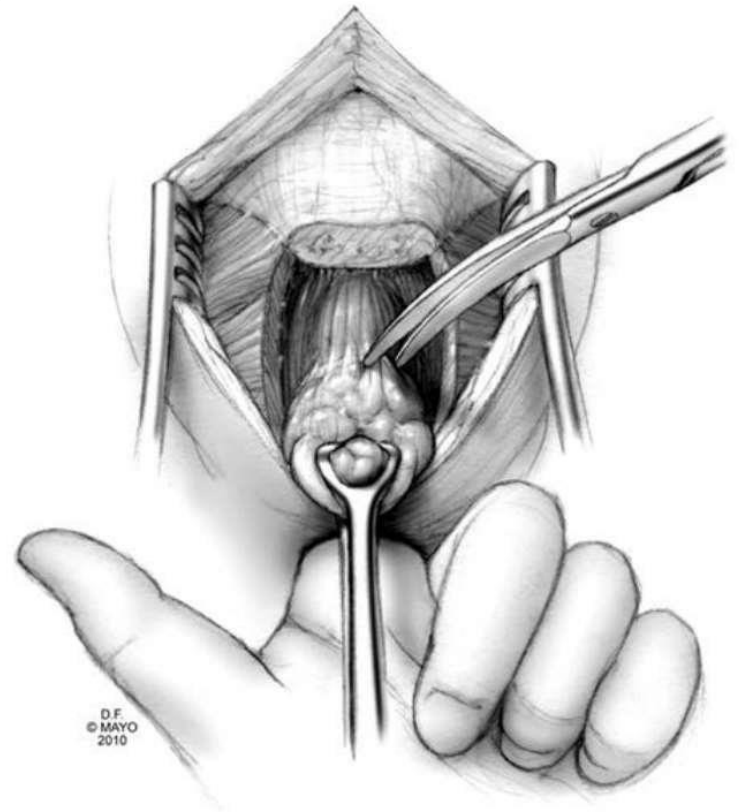
Surgical approach



Dozois EJ & Marcos MDH. Presacral tumors. In: Beck DE, Roberts PL, Saclarides TJ, Senagore AJ, Stamos MJ & Wexner SD, editors. The ASCRS Textbook of Colon and Rectal Surgery. New York: Springer Publishing Company, 2011; used with permission of Mayo Foundation for Medical Education and Research, all rights reserved.

Posterior approach

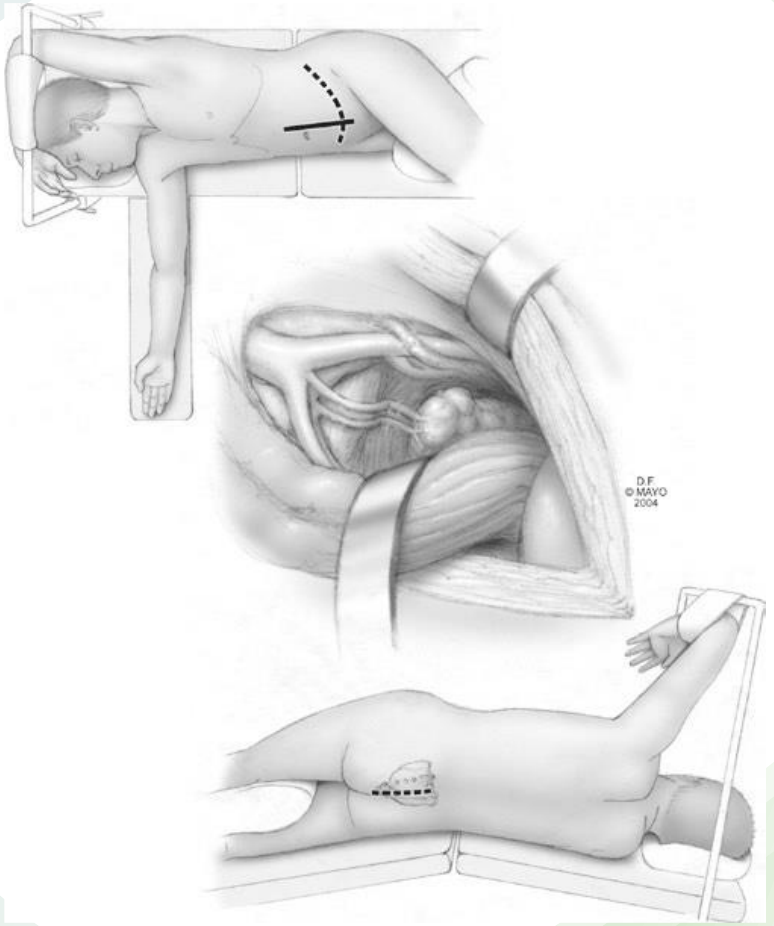
- Prone jackknife position.
- Incision (midline, parasacral, paracoccygeal or transverse)
- Disscetion down to the distal sacrum/coccyx and through the anococcygeal ligament,
- Coccygectomy or Distal Sacrectomy only if malignancy invading it.
- Entry into the presacral space
- A pseudocapsule is often encountered and facilitates a safe dissection from surrounding tissues including the rectum



Combined Anterior- Posterior Approach

Anterior phase

- Supine position, transabdominally
- Modified ‘Sloppy’ lateral position- two team approach.
- The lateral attachments of the sigmoid colon are mobilized
- presacral space entered
- Ureters and superior hypogastric nerves are identified and preserved
- The mesorectum is dissected off the presacral fascia
- The rectum is mobilized
- Small, Benign tumors – Circumferential dissection and removal
- Bulky tumors/Invasion – enblock resection of rectum with anastomosis and diverting ileostomy
- If bilateral S3 roots or S2 involved- End Sigmoid colostomy.



- If Major Sacrectomy is planned – Ligation of middle sacral artery and internal iliac artery and its branches.
- High sacrectomy > fixation to avoid pelvic instability
- Preserve anterior division of internal iliac artery – as it gives off inferior gluteal artery and prevents potential perenial and gluteal necrosis.
- If extended sacral resection- Rectus abdominis flap.

Posterior phase

- Abdominal incision is closed, and ostomy created before prone position.
- Midline incision over sacrum and coccyx.
- Anococcygeal ligament transected, and levators retracted bilaterally.
- Dissection of gluteus maximus muscle on both sides.
- Division of Piriformis to expose the sciatic nerves.
- Osteotomy – at S3 level or higher. Preserve at least one S 3 nerve root.
- The neural sac may need to be ligated.


NOT TO BE MINISTERED UNTO BUT TO MINISTER
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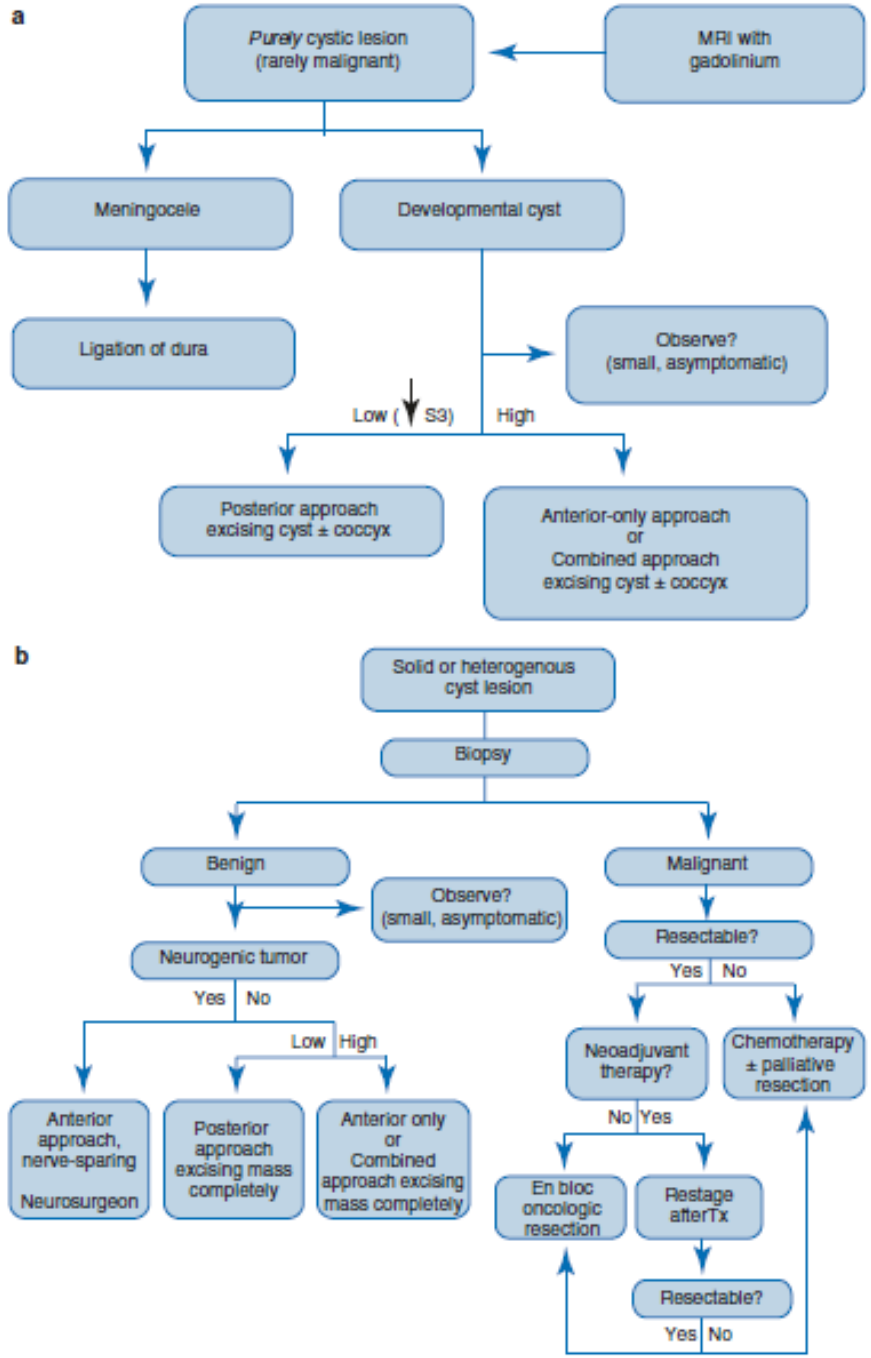
Minimally invasive approaches

- Laparoscopic and robotic techniques are safe and feasible means for removing presacral tumors in selected patients
- **Contraindicated** in **very large tumors** or **malignant tumors that involve the pelvic sidewall, sacrum, or multiple viscera**
- Mullaney and colleagues at Mayo Clinic did a systematic review on surgical outcomes of 82 patients who underwent MIS for presacral tumors that met the inclusion criteria they found no difference regarding tumor recurrence , morbidity and mortality in comparison to open technique

- Mullaney TG, Lightner AL, Johnston M, Kelley SR, Larson DW, Dozois EJ. A systematic review of minimally invasive surgery for retrorectal tumors. Tech Coloproctol. 2018;22(4):255–63.


a
Purely cystic lesion (rarely malignant)
MRI with gadolinium
Meningocele
Developmental cyst
Ligation of dura
Observe? (small, asymptomatic)
Low (
S3)
High
Posterior approach excising cyst ± coccyx
Anterior-only approach or Combined approach excising cyst ± coccyx
b
Solid or heterogenous cyst lesion
Biopsy
Benign
Observe? (small, asymptomatic)
Neurogenic tumor
Yes
No
Low
High
Anterior approach, nerve-sparing
Neurosurgeon
Posterior approach excising mass completely
Anterior only or Combined approach excising mass completely
Malignant
Resectable?
Yes
No
Neoadjuvant therapy?
Chemotherapy ± palliative resection
No
Yes
En bloc oncologic resection
Restage afterTx
Resectable?
Yes
No


Thank you!