Original Article

Surgical Outcomes of Retrorectal Tumors: A Retrospective Study of 12 Years' Experience

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Received: 1/14/2025
Accepted: 7/3/2025

ABSTRACT

Background: Retrorectal tumors are rare, heterogeneous neoplasms in the pararectal space that have low incidence, nonspecific symptoms, and variable presentations; they are often challenging to diagnose and manage, necessitating high clinical suspicion. We evaluated the clinical characteristics, diagnostic challenges, surgical outcomes, and postoperative follow-up of patients with retrorectal tumors treated over 12 years.

Methods: A retrospective case series was conducted on 34 patients who underwent surgery for retrorectal tumors at Taleghani Hospital, Tehran, Iran, from 2011 to 2023. Clinical presentations, imaging findings, surgical interventions, histopathological diagnoses, and postoperative outcomes were analyzed.

Results: Thirty-four patients with 37 lesions were included, with a mean age of 40.21 ± 11.57 years. The majority of patients were female (88.2%). Pelvic pain was the most common symptom (44.1%), followed by rectal pain (38.2%). The retrorectal space was the most frequently affected location (67.6%). Most tumors were cystic (51.4%), with congenital tumors being the most common histopathological subtype (37.8%). Malignancy was identified in 29.7% of cases. The most frequent surgical approach was total resection via the posterior approach (55.9%), followed by the anterior approach (26.5%). Postoperative recurrence requiring secondary surgery was observed in 5.9% of patients.

Conclusion: Due to their rarity and diverse presentations, retrorectal tumors pose significant diagnostic and surgical challenges. Preoperative imaging plays a critical role in diagnosis and surgical planning. Complete surgical excision remains the mainstay of treatment, and recurrence is rare. Multidisciplinary collaboration is essential for optimizing patient outcomes.

KEYWORDS
Retrorectal Tumors; Surgical Outcome; Tumor Resection; Incidental Findings

Please cite this paper as:
Dashti MD, Zeinalpour A, Nikshoar MR, Hashempour MR, Ariapour A, Pishgahi M, Sadeghi A, Anaraki Firooz FA. Surgical Outcomes of Retrorectal Tumors: A Retrospective Study of 12 Years' Experience. World J Plast Surg. 2025;14(2):56-62.
doi: 10.61186/wjps.14.2.56

[Downloaded from wjps.ir on 2026-10-13]

[DOI: 10.61882/wjps.14.2.56]

INTRODUCTION

Retrorectal tumors are rare neoplasms with diverse histological types that arise in the pararectal space, defined as the potential area between the mesorectum and the pelvic wall [1]. This variability likely stems from the presence of embryonic remnants and the diversity of tissues in the presacral and retrorectal regions [2]. These tumors range from benign cysts to malignant masses capable of invading adjacent pelvic structures [2]. The heterogeneity and complexity of retrorectal tumors create challenges in their classification and management [3].

The incidence of retrorectal tumors is exceptionally low, estimated at 1 in 40,000 to 1 in 60,000 hospital admissions [4]. They are often asymptomatic and are typically discovered incidentally during pelvic examinations or imaging studies such as CT or MRI. When symptomatic, patients may present with pelvic pain, constipation, defecatory disturbances caused by compressive effects, or cyst infections mimicking anal fistulas or pilonidal sinuses [1].

Diagnosing and treating retrorectal tumors can be challenging for clinicians due to their asymptomatic nature or nonspecific presentations, often resulting in misdiagnosis [5]. Surgical excision is the mainstay of treatment for all retrorectal tumors, even benign ones, due to their potential for symptomatic progression or malignant transformation [6]. The choice of surgical approach—abdominal (anterior), perineal (posterior), or combined abdominopelvic—depends on the tumor's size, location, and complexity [6] .

The primary origin of retrorectal tumors is attributed to totipotent cells in the retrorectal space. These tumors are broadly categorized into four groups: congenital, acquired, benign, and malignant. Approximately two-thirds are congenital, often cystic, and nearly half have malignant potential [7]. MRI is the preferred diagnostic modality for these tumors, providing superior anatomical detail and characterization. Given their significant risk of malignancy, surgical resection is mandatory.

We report here a relatively large cohort of patients referred to the Colorectal Surgery Department of a tertiary hospital. We presented their clinical characteristics, surgical outcomes, and postoperative follow-ups to contribute to the understanding and managing these rare tumors.

PATIENTS AND METHODS

This descriptive case series study investigated the surgical outcomes of retrorectal tumors treated over the past 12 years at Taleghani Hospital, Tehran, Iran. The study retrospectively analyzes hospital records to assess these rare tumors' clinical presentations, diagnostic challenges, surgical approaches, and postoperative consequences. Medical records of 34 patients who underwent retrorectal tumor surgery between 2011 and 2023 were reviewed. Inclusion criteria included patients diagnosed with retrorectal tumors who underwent surgery during the specified period. Exclusion criteria included patients with concurrent tumors.

Documented data included demographic characteristics, clinical presentations, and physical examination findings. Additionally, imaging results, surgical details, tumor pathology, and postoperative outcomes, including recurrence and secondary surgical interventions, were analyzed. Radiological evaluations, such as magnetic resonance imaging (MRI) or computed tomography (CT) scans, were performed on all patients before surgery. Relevant imaging findings were documented, including tumor size, location, morphology, and potential invasion of adjacent structures. These findings were important in identifying clinical and pathological patterns, improving diagnostic and therapeutic strategies, and guiding treatment planning while predicting treatment outcomes. Data obtained from examinations and imaging were essential for formulating treatment plans and assessing prognosis.

RESULTS

A total of 34 patients with 37 lesions were enrolled. Most patients (32 patients, 94.1%) presented with a single lesion, while one patient presented with two and another with three lesions. The mean age of the population was 40.21 ± 11.57 years, constituted of 30 females (88.2%). Pelvic pain was the most common symptom, present in 15 patients (44.1%) of the patients, followed by rectal pain which was present in 13 patients (38.2%). With regard to lesion location, the Retrorectal space was the most frequent anatomical location affected, observed in 23 patients (67.6%). Additionally, history of perianal surgery was reported in in 4 patients (11.8%).

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[DOI: 10.61882/wjps.14.2.56]

Most of the lesions were cystic in nature as 19 lesions (51.4%) were cystic, 15 lesions (40.5%) were solid mass lesions, and 3 lesions (8.1%) were solid-cystic in composition. Pathologic report of the lesions demonstrated most lesions to be benign (n=24, 64.9%); 11 lesions (29.7%) were malignant, and 2 lesions (5.4%) were non-neoplastic. Congenital lesions were the most frequent histopathologic subtype observed in 14 lesions (37.8%), followed by mesenchymal lesions which were found in 12 lesions (32.4%). The lesion size varied from 5 mm to 95 mm in diameter, with an average diameter of 54.48 ± 21.51 mm. The majority of the lesions were located at the third sacral level (S3) and represented 78.4% (n = 29) of the cases. Total resection by posterior approach was the most common surgical approach, and was utilized in 19 patients (55.9%), followed by total resection by anterior approach which was used in 9 patients (26.5%). Moreover, postoperative recurrence and need for secondary surgery were observed in 2 patients (5.9%). Table 1 summarizes the patients' findings. Table 2 presents patient level data.

DISCUSSION

Our study evaluated 34 patients undergoing surgery for retrorectal tumors over 12 years, analyzing their clinical presentations, diagnostic challenges, surgical approaches, and histopathological findings. Pain was the most reported prevalent symptom, ranging from 44.1% to 2.9%, with locations varying from the pelvis and rectum to the perianal and abdominal regions. This variability underscores the anatomical complexity of retrorectal tumors and highlights the need for comprehensive clinical evaluations. Pelvic was the most common location for pain (44.1%). Additionally, 32.4% of patients presented with rectal pain, while a small subset (5.9%) had rectal bleeding, emphasizing the necessity of considering retrorectal tumors even in patients with nonspecific or minimal symptoms.

Retrorectal tumors are rare and frequently misdiagnosed because of their nonspecific presentations [8]. Conditions such as anal fistulas, pilonidal cysts, perianal abscesses, or psychological pain may mimic their symptoms, delaying definitive diagnosis [9]. Patients often underwent multiple surgical operations before the correct diagnosis was determined; an average of 4.1 surgeries were performed before a retrorectal lesion was identified [10]. This points to the need for clinicians to have a high index of suspicion for retrorectal tumors, especially when posterior pelvic masses are present [11]. Imaging plays an important role in the diagnosis of retrorectal tumors. Transrectal ultrasonography has shown a sensitivity of 100% when combined with proctoscopy, but computed tomography (CT) and magnetic resonance imaging (MRI) are considered the gold standards for preoperative evaluation [12, 13]. These modalities are useful not only in the establishment of the presence of a tumor but also in defining its characteristics, such as size, location, and relationship with surrounding structures, which are important for surgical planning [14, 15]. However, the overlapping imaging characteristics of various retrorectal lesions can complicate the diagnostic process. For example, cystic lesions like tailgut cysts may be indistinguishable from other types of cysts on imaging, leading to potential misdiagnosis [16]. Our findings emphasize the need for clinicians to consider retrorectal tumors in the differential diagnosis of patients presenting with chronic pelvic or rectal pain.

A key insight from our study is the significance of incidental findings during patient physical examinations. Retrorectal tumors often present with nonspecific symptoms or remain asymptomatic, leading to delayed diagnosis [17]. However, careful attention to incidental findings unrelated to the patient's primary complaint can provide critical diagnostic clues. For example, masses detected during rectal or pelvic examinations, subtle changes in anatomical structures, or findings of induration in the retrorectal region can direct the diagnostic pathway toward identifying these rare tumors [18]. The discovery of such incidental findings illustrates the need for a thorough and systematic examination of patients, even when their presenting symptoms seem unrelated to retrorectal pathology. These findings can significantly increase the accuracy of diagnosis when integrated with imaging results and help properly formulate treatment plans. Because of this, clinicians always have to be alert and consider the implications of incidental findings in clinical practice.

Retrorectal tumors include diverse benign and malignant lesions originating from various tissues. Benign cysts, similar to intestinal cysts, are the most common and are often asymptomatic, discovered

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[DOI: 10.61882/wjps.14.2.56]

Table 1: Patient characteristics

Characteristics	Level	Values
Age [a], years		40.21 ± 11.57
Sex [a]	Male	4 (11.8)
	Female	30 (88.2)
History of Surgery [a]		4 (11.8)
Symptoms [a]	Pelvic Pain	15 (44.1)
	Rectal Pain	13 (38.2)
	Rectorrhage	2 (5.9)
	Perianal Pain	1 (2.9)
	Abdominal Pain	1 (2.9)
	Fistula	1 (2.9)
Location [b]	Retrorectal	24 (64.9)
	Pelvic	10 (27.0)
	Retrorectal + Pararectal	2 (5.4)
	Rectovaginal	1 (2.7)
Lesion Type [b]	Cystic	19 (51.4)
	Solid Mass	15 (40.5)
	Solid Cystic Mass	3 (8.1)
Pathology [b]	Non-neoplastic	2 (5.4)
	Benign	24 (64.9)
	Malignant	11 (29.7)
Histopathology [b]	Congenital	14 (37.8)
	Mesenchymal	12 (32.4)
	Epithelial	5 (13.5)
	Neurogenic	3 (8.1)
	Non-neoplastic	2 (5.4)
	Notochord	1 (2.7)
Largest diameter [b], mm		54.48 ± 21.51
Lesion Level [b]	S1	1 (2.7)
	S3	29 (78.4)
	S4	7 (18.9)
Surgical Approach [a]	Total Resection- Posterior Approach	19 (55.9)
	Total Resection- Anterior Resection	9 (26.5)
	Low Anterior Resection	3 (8.8)
	Total Resection- Abdominoperineal Resection	2 (5.9)
	Total Resection- Perineal Approach	1 (2.9)
Recurrence (Need for Second Surgery) [a]		2 (5.9)

[a], out of 34 patients
[b], out of 37 lesions
quantitative data are presented as mean± standard deviation
qualitative data are presented as frequency and percentages

incidentally. Malignant lesions, such as polypoid squamous carcinoma, can arise from the epithelial cells of the rectum and extend to adjacent tissues. Other frequently encountered tumors include cloacal cysts, derived from embryonic urogenital remnants, and spindle cell benign neoplasms, which originate from nerve or smooth muscle cells. Given the complexity of pelvic anatomy, accurately classifying tumor location is essential, as it directly influences the choice of surgical technique and outcomes [4, 10]. In our study, 64.9% of lesions were benign, 29.7% were malignant, and 5.4% were non-neoplastic. Congenital tumors were the most common histopathological subtype (37.8%), including enteric cysts, dermoid cysts, and cloacal cysts. Mesenchymal tumors accounted for 32.4% of cases, while neurogenic, epithelial, and notochordal tumors represented smaller proportions. Malignant

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[DOI: 10.61882/wjps.14.2.56]

Table 2: Patient level findings

ID	Age	Sex	Hx of Surgery	Symptoms	Location	Lesion Type	Pathology	Largest Diameter	Level	Surgical Approach	Recurrence
1	38	F	N	Perianal pain, Rectorrhage	Retrorectal	Mass	Squamous Carcinoma	• 5.00 • 8.00	S3	LAR	N
2	33	F	N	Asymptomatic	Retrorectal	Cystic	Cloacal Cyst	30.00	S4	Total Resection Posterior Approach	N
3	58	F	N	Rectal Pain	Retrorectal	Cystic	Cloacal Cyst	55.00	S3	Total Resection	N
4	41	F	N	Rectal Pain	Retrorectal	Cystic	Leiomyoma	55.00	S3	Posterior Approach	N
5	43	F	Y	Abdominal Pain	Retrorectal	Cystic	Epidermal Inclusion Cyst	45.00	S4	Total Resection Posterior Approach	Y
6	32	F	N	Asymptomatic	Retrorectal	Solid Cystic Mass	Leiomyoma	44.00	S3	Total Resection Posterior Approach	N
7	48	F	N	Asymptomatic	Retrorectal	Cystic	Tail gut cyst	40.00	S3	Total Resection Posterior Approach	N
8	58	F	Y	Rectal Pain	Retrorectal	Solid Cystic Mass	Cloacogenic Carcinoma	77.00	S1	Total Resection Abdominoperineal Resection	N
9	37	F	N	Rectal Pain	Retrorectal	Cyst	Tail gut cyst	30.00	S4	Total Resection Posterior Approach	N
10	32	M	N	Pelvic Pain	Pelvic	Mass	Fibrolipoma	44.00	S3	Total Resection Anterior Approach	N
11	48	F	N	Pelvic Pain	Pelvic	Mass	Leiomyoma	95.00	S3	Total Resection Anterior Approach	N
12	33	F	N	Pelvic Pain	Pelvic	Mass	High Grade Sarcoma	60.00	S3	Total Resection Anterior Approach	N
13	21	F	N	Pelvic Pain	Pelvic	Mass	Paraganglioma	65.00	S3	Total Resection Anterior Approach	N
14	41	F	N	Pelvic Pain	Pelvic	Mass	Low Grade Spindle Neoplasm	44.00	S3	Total Resection Anterior Approach	N
15	46	F	N	Pelvic Pain	Pelvic	Mass	High Grade Sarcoma	77.00	S3	Total Resection Anterior Approach	N
16	43	F	N	Pelvic Pain	Pelvic	Mass	Schwannoma	70.00	S3	Total Resection Anterior Approach	N
17	36	F	N	Pelvic Pain	Retrorectal	Mass	Schwannoma	60.00	S3	Total Resection Posterior Approach	N
18	47	F	N	Rectal Pain	Retrorectal	Cystic	Teratoma	30.00	S3	Total Resection Posterior Approach	N
19	42	F	N	Pelvic Pain	Retrorectal + Pararectal	Cystic	Tail gut cyst	• 30.00 • 20.00 • 60.00	S4	Total Resection Posterior Approach	Y
20	25	F	N	Rectal Pain	Retrorectal	Cystic	Tail gut	60.00	S4	Total Resection Posterior Approach	N
21	29	F	N	Rectal Pain	Retrorectal	Cystic	Dermoid	60.00	S3	Total Resection Posterior Approach	N
22	26	F	Y	Rectal Pain, Fistula	Retrorectal	Cystic	Dense Fibro collagenous tissue	54.00	S3	Total Resection Posterior Approach	N
23	20	F	Y	Rectal Pain	Retrorectal	Solid Cystic Mass	Granulation Tissue	80.00	S3	Total Resection Posterior Approach	N
24	70	F	N	Rectorrhage	Retrorectal	Mass	Cloacal	50.00	S3	Total Resection Abdominoperineal Resection	N
25	46	F	N	Rectal Pain	Retrorectal	Cystic	Dermoid	65.00	S3	Total Resection Posterior Approach	N
26	26	F	N	Rectal Pain	Retrorectal	Cystic	Epidermal Inclusion Cyst	66.00	S3	Total Resection Posterior Approach	N
27	28	F	N	Rectal Pain	Retrorectal	Cystic	Dermoid	77.00	S3	Total Resection Posterior Approach	N
28	33	M	N	Rectal Pain	Retrorectal	Cystic	Hemangiopericytoma	80.00	S3	Total Resection Posterior Approach	N
29	46	M	N	Pelvic Pain	Pelvic	Mass	GIST	66.00	S3	Total Resection Anterior Approach	N
30	59	F	N	Pelvic Pain	Rectovaginal	Mass	GIST	85.00	S3	Total Resection Perineal Approach	N
31	47	M	N	Pelvic Pain	Pelvic	Mass	GIST	53.00	S3	LAR	N
32	38	F	N	Pelvic Pain	Retrorectal	Mass	Cordoma	88.00	S3	Total Resection Anterior Approach	N
33	43	F	N	Pelvic Pain	Pelvic	Mass	Sarcoma	34.00	S3	LAR	N
34	54	F	N	Pelvic Pain	Retrorectal	Cystic	Dermoid	54.00	S3	Total Resection Posterior Approach	N

Hx, History; F, Female; N, No; LAR, Low Anterior Resection; Y, yes; M, Male; GIST, Gastrointestinal Stromal Tumors

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[DOI: 10.61882/wjps.14.2.56]

lesions, such as high-grade sarcomas, chordomas, and cloacogenic carcinomas, posed significant management challenges due to their aggressive behavior and complex anatomical involvement. These findings highlight the importance of accurate histopathological classification to guide treatment decisions effectively.

Surgery is one of the primary treatments for retrorectal tumors, during which a surgeon can remove the tumor and surrounding cancerous tissue. The type of surgery depends on the tumor's location and level, and in some cases, additional treatments may be needed before or after surgery. Due to the limited effectiveness of surgery alone, it should be combined with other methods to improve its efficacy. For instance, preoperative radiotherapy and chemotherapy can make otherwise inoperable tumors operable. In contrast, postoperative radiotherapy and chemotherapy can control any remaining localized lesions or microscopic metastases and reduce the risk of distant metastases. Another option, immunotherapy, has yielded promising results in treating advanced rectal cancer. In these patients, targeted immune therapy or immunotherapy combined with chemotherapy and radiotherapy can be an alternative to surgery [19]. Surgical resection remains the cornerstone of treatment for retrorectal tumors. In our study, total resection via the posterior approach was the most commonly employed technique (55.9%), particularly for tumors located at or above the S3 level. The anterior approach was used in 26.5% of cases, while combined abdominoperineal resection and perineal approaches were reserved for more complex cases requiring extensive access. Complete tumor excision is critical for minimizing recurrence risk and achieving favorable outcomes. Postoperative recurrence requiring secondary surgery was observed in 5.9% of patients, emphasizing the need for meticulous surgical planning and long-term follow-up.

Due to the rarity and nonspecific presentation of retrorectal tumors, early diagnosis of retrorectal tumors requires a high degree of clinical suspicion, particularly in patients with vague pelvic or rectal symptoms. Multidisciplinary collaboration involving radiologists, pathologists, and surgeons is vital to ensure precise diagnosis and treatment. Surgical approaches must be tailored to the tumor's location, size, and histology, prioritizing radical resection while minimizing postoperative complications. In malignant cases, adjuvant therapies such as radiotherapy or chemotherapy may improve long-term outcomes. Further research is essential to refine diagnostic strategies, evaluate novel therapeutic modalities, and establish standardized management guidelines for these uncommon tumors.

CONCLUSION

This study indicated the importance of comprehensive assessment and individualized surgical strategies in managing retrorectal tumors. Pain was the most common presenting symptom, emphasizing the need for careful clinical evaluation. Imaging plays a critical role in diagnosis and surgical planning, while radical surgical excision remains the primary treatment. Attention to incidental findings during patient examinations can guide earlier and more accurate diagnoses, ultimately improving outcomes.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interests.

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[DOI: 10.61882/wjps.14.2.56]