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Evaluation of clinical features, diagnosis, treatment, and surgical outcomes in cases of hydatid cysts with atypical localization: a retrospective study

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ABSTRACT

Aims: This single-center case series aimed to evaluate the clinical features, diagnostic challenges, and surgical outcomes of hydatid cysts in atypical locations.

Methods: This retrospective study included patients who underwent surgery between 2014 and 2024 for pathologically confirmed hydatid cysts located outside the liver, spleen, and pancreas. Postoperative recurrence, intraoperative and postoperative complications, and the need for reoperation were evaluated. All patients were assessed by ultrasonography, computed tomography, or both according to standard diagnostic protocols for hydatid disease, and received albendazole as adjuvant therapy regardless of cyst localization.

Results: Ten patients (mean age 44.5±17.7 years; 8 females, 2 males) were included. Cysts were localized to the musculoskeletal tissues (n=5, 50%), the retroperitoneum (n=3, 30%), the adrenal gland (n=1, 10%), and the adnexal region (n=1, 10%). Total cyst excision was performed in eight patients (80%), while cystotomy and drainage were required in two patients (20%). Postoperative recurrence was observed in two patients (20%): one following excision of a gluteal cyst and the other after drainage of a retroperitoneal cyst; both underwent reoperation. No intraoperative or postoperative complications or mortality were observed during the follow-up period.

Conclusions: This case series demonstrates that hydatid cysts with atypical localization present with diverse anatomical involvement and may be associated with an increased risk of postoperative recurrence, particularly after non-radical surgical procedures. Careful preoperative evaluation and complete surgical excision, when feasible, may reduce the need for reoperation in these patients.

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Introduction

Hydatid cyst disease is an ancient zoonotic infection caused by *Echinococcus granulosus*. This disease is prevalent worldwide, particularly in the Middle East, including Iran, Iraq, and Türkiye. Dogs and other canids act as definitive hosts for the parasite, while sheep, cattle, goats, and camels serve as intermediate hosts. Humans become accidentally infected by ingesting water or food contaminated with the parasite eggs excreted in the feces of dogs. Once ingested, the larvae penetrate the intestinal wall, enter the bloodstream, and migrate to various regions of the body, where they grow and form hydatid cysts (1,2).

The majority of hydatid cyst cases occur in the liver (60-70%) and in the lungs (20%). While the liver and lungs are the most frequently involved organs, atypical localizations present unique diagnostic and therapeutic difficulties. In endemic areas, these unusual presentations may be easily overlooked, leading to delays in diagnosis and treatment (1,2).

Although the epidemiology and management of hepatic and pulmonary hydatid cysts are well documented, there is limited comprehensive data on hydatid cysts arising in non-solid organs or soft tissue structures (1,2). Most available evidence consists of isolated case reports and small series, which do not provide a clear understanding of their clinical spectrum, surgical challenges, or outcomes. Consequently, it remains arguable whether established principles derived from hepatic and pulmonary diseases can be directly applied to these atypical sites. In the current literature, the term “atypical localization” is commonly used to describe hydatid cyst involvement outside the liver and lungs, including musculoskeletal, retroperitoneal, pelvic, adrenal, and other extrahepatic sites (3,4).

This knowledge gap is significant because hydatid cysts at uncommon sites, such as the spleen, retroperitoneum, musculoskeletal system, and adnexal and adrenal regions, have been reported only sporadically, with incidence rates ranging from 0.2% to 10%, depending on the site (3,4). Rare localizations include the spleen (0.9-8%), skeleton (0.2-3%), kidneys (0.4-3.7%), brain (0.4-1%), myocardium (0.02-1.1%), peritoneum (2-5.2%), retroperitoneum (6-10%), and subcutaneous tissue (1.6%) (3,4).

These unusual cysts can mimic other pathologies, complicate operative management due to anatomical constraints, and increase the risk of recurrence (4). The lack of specific radiological findings and the rarity of the condition often make it difficult to consider in the differential diagnosis.Therefore, in any endemic region, even when hydatid cysts are located in atypical sites, a high index of suspicion should be maintained to overcome diagnostic challenges (4).

The aim of the present study is to report a 10-year single-center retrospective case series of hydatid cysts with atypical localization, focusing on their anatomical distribution, clinical features, diagnostic challenges, and surgical outcomes.

Methods

Study design and setting

The hospital records of patients who underwent surgery for hydatid cysts in the general surgery clinic were retrospectively reviewed for 10 years, from 2014 to 2024. Cases were considered hydatid cysts when pathological examination of surgically resected specimens confirmed the diagnosis postoperatively. The patients’ demographic information, clinical findings, diagnostic methods, surgical treatments, postoperative complications, hospital stay, and follow-up data were retrospectively reviewed and analyzed.

Ethical Approval

This study received approval from the Süleyman Demirel University Health Sciences Ethics Committee (approval number: 7, date: 06.01.2025). This study was conducted in accordance with the principles of the Declaration of Helsinki. Patients were not required to give their informed consent for inclusion in this retrospective study because we used anonymous clinical data and individuals cannot be identified from the presented data.

Case identification and study cohort

During the 10-year study period, all surgically treated hydatid cyst cases were reviewed, and patients with atypical localization were identified based on predefined inclusion criteria. During the study period, a total of 85 surgically treated hydatid cyst cases were reviewed. Seventy-five cases with hepatic, splenic, or pancreatic involvement were excluded; 10 cases with atypical localization constituted the final study cohort.

Inclusion criteria and definitions

Patients with pathologically confirmed hydatid cysts located outside the liver, spleen, and pancreas were included to focus on atypical localizations, as defined in the current literature.

Typical and atypical case situations were defined for this study. Typical hydatid cysts were defined as cysts involving the liver, spleen, or pancreas, whereas atypical hydatid cysts were defined as those located outside these organs.

Outcomes

The main outcomes assessed were postoperative recurrence, intraoperative and postoperative complications, and the need for reoperation.

Statistical Analysis

Descriptive statistics, including means, standard deviations, ranges, and percentages, were calculated using Microsoft Excel, and no comparative statistical analyses were performed.

Results

Patient characteristics

A total of 10 patients with atypical hydatid cyst localizations were included in the study. The mean age was 44.5±17.7 years (range: 18-74), with 8 females (80%) and 2 males (20%). The cysts were localized to musculoskeletal tissues, including the right gluteus muscle, right rectus muscle, medial thigh, left psoas muscle, and subcutaneous tissue of the anterior abdominal wall (n=5, 50%). Retroperitoneal localization was observed in three patients (n=3, 30%), including lesions at the T12-L1 vertebral level and posterior to the bladder, with or without concurrent liver involvement. Isolated involvement of the right adnexal region and right adrenal gland were identified in one patient each (n=1, 10% each). Table 1 summarizes the demographic and clinical characteristics of the patients, and Figure 1 illustrates the anatomical distribution of the cysts. Percentages are calculated based on the total number of patients with atypically localized hydatid cysts (n=10).

Clinical presentation

The clinical manifestations of atypically localized hydatid cysts were heterogeneous and primarily related to the anatomical site of involvement. The most frequent symptom was localized pain, reported in six patients (inguinal region, right upper quadrant, left upper quadrant, and epigastric region). Two patients presented with swelling and palpable masses, one in the right gluteus muscle and the other in the medial thigh. In addition, one patient presented with abdominal wall swelling and another presented with pelvic pain mimicking gynecological pathology. None of the patients had systemic symptoms such as fever or weight loss at the time of admission (Table 1).

Diagnostic imaging and surgical treatment

All patients underwent preoperative imaging via ultrasonography (USG) and/or computed tomography (CT) to evaluate cyst characteristics. The dimensions of the cysts were as follows: length: mean 6.8±3.3 cm (range: 4-15 cm), width: mean 5.05±2.1 cm (range: 2-9 cm). Cystectomy was performed on 8 patients. In 2 cases, cystotomy and drainage were performed because of anatomical complexity. Serology was positive in 9 patients and negative in 1.

Diagnostic imaging findings, cyst dimensions, radiological characteristics, retrospective World Health Organization-Informal Working Group on Echinococcosis (WHO-IWGE) classification, and recurrence patterns are summarized in Table 2. Imaging revealed heterogeneous and often indeterminate cystic appearances that depended on anatomical location, and definitive WHO-IWGE classification was possible in only a limited number of cases. In most patients, imaging findings alone were insufficient to make a confident preoperative diagnosis; the final diagnosis of hydatid disease was established intraoperatively and subsequently confirmed by histopathology.

Preoperative imaging findings were heterogeneous and varied by anatomical location. Based on a retrospective evaluation using the WHO-IWGE classification, definitive classification was possible in only 3 of 10 cases (30%): two cystic echinococcosis stage 3 lesions and one CE2 lesion. In the remaining 7 cases (70%), the imaging findings were non-specific and could not be confidently classified according to the WHO-IWGE criteria.

Several lesions demonstrated imaging characteristics overlapping with simple cysts or cystic neoplasms, including well-defined or septated cystic appearances that lacked pathognomonic features of hydatid disease. Consequently, the indication for surgery was not based on imaging findings alone. Surgical decision-making relied on a combination of clinical symptoms, endemic background, anatomical localization, serological results, and intraoperative findings. The final diagnosis of hydatid disease in these cases was established intraoperatively and confirmed by histopathological examination.

Medical treatment and follow-up

All patients received postoperative albendazole therapy at a dose of 10 mg/kg/day. Preoperative albendazole was administered in three cases. Postoperative medical treatment was prescribed according to institutional protocol for a minimum duration of three months, with treatment duration extended in selected patients based on intraoperative findings and clinical judgment. Due to the retrospective nature of the study and incomplete outpatient treatment records, the precise mean treatment duration and its range could not be reliably calculated.

The minimum follow-up was at least 24 months. Follow-up beyond this period was variable and not uniformly documented for all patients, particularly in cases treated earlier in the study period. During follow-up, two patients (20%) developed recurrence, and both required reoperation.

The first recurrence occurred in a patient who had initially undergone cystectomy for a right gluteal intramuscular hydatid cyst. Routine follow-up imaging detected recurrence 4 months after the primary surgery, revealing multiple hydatid cysts in the retroperitoneal region adjacent to the rectum and bladder. The patient underwent reoperation, and no further recurrence was observed during follow-up.

The second recurrence was observed in a patient who had previously undergone drainage and curettage for a retroperitoneal hydatid cyst located at the T12-L1 level. Two years after the initial operation, follow-up imaging identified a recurrent cyst in the same retroperitoneal region. The patient underwent reoperation with drainage and curettage; no recurrence was detected thereafter.

No mortality or serious postoperative complications were recorded during the follow-up period.

Table 1. Demographic, clinical, and surgical characteristics of patients with atypically localized hydatid cysts

Case number	Age	Gender	Presenting complaint	Surgical method	Serology	Location	Preop anthelmintic	Postop anthelmintic	Recurrent
Case 1	29	Male	Swelling over the right gluteus	Cystectomy	Positive	Right gluteus	Albendazole (10 mg/kg/day)	Albendazole (10 mg/kg/day)	Present (rectum-bladder neighborhood hydatid cyst reop)
Case 2	50	Female	Epigastric pain	Cystectomy	Negative	Right rectus muscle	None	Albendazole (10 mg/kg/day)	None
Case 3	47	Female	Pain in the Inguinal area	Cystectomy	Positive	Pelvis (left ureter-bladder)	None	Albendazole (10 mg/kg/day)	None
Case 4	50	Female	Right quadrant pain	Drainage + curettage	Positive	T12-L1 Retroperitoneum	Albendazole (10 mg/kg/day)	Albendazole (10mg/kg/day)	Present (retroperitoneum)
Case 5	74	Female	Pain in the right inguinal region	Cystectomy	Positive	Right adnexal region	None	Albendazole (10 mg/kg/day)	None
Case 6	51	Female	Pain in the right upper quadrant	Cystectomy	Positive	Liver+right adrenal	None	Albendazole (10 mg/kg/day)	None
Case 7	20	Male	Lower quadrant pain	Cystectomy	Positive	Liver+bladder posterior	None	Albendazole (10 mg/kg/day)	None
Case 8	18	Female	Swelling in the medial right thigh	Cystectomy	Positive	Right medial thigh	Albendazole (10 mg/kg/day)	Albendazole (10 mg/kg/day)	None
Case 9	62	Female	Pain in the left upper quadrant	Cystotomy + drainage + curettage	Positive	Left upper abdominal anterior wall	None	Albendazole (10 mg/kg/day)	None
Case 10	44	Female	Pain in the right upper quadrant	Cystectomy	Positive	Left psoas muscle	None	Albendazole (10 mg/kg/day)	None

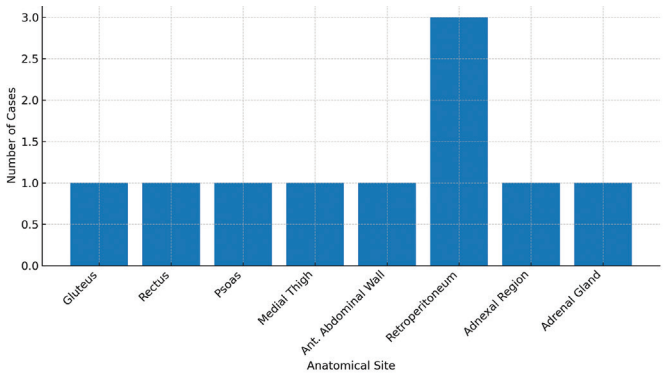


Figure 1. Anatomical distribution of atypically localized hydatid cysts

Discussion

Hydatid cyst disease most frequently involves the liver and lungs; however, atypical localizations also occur and represent significant diagnostic and therapeutic challenges. Our series supports the existing knowledge that musculoskeletal and retroperitoneal sites are among the most common atypical localizations, consistent with prior reports (4). These unusual presentations often manifest with non-specific symptoms, leading to delays in diagnosis and treatment.

Atypical localizations of hydatid cysts are rarely reported in the literature and are most often presented as case reports or small retrospective series. Although novel intraoperative diagnostic methods, such as the lipid test evaluated in the Lili-Hics trial for liver hydatid cysts (5), have been proposed, imaging modalities remain the essential and irreplaceable tools for preoperative evaluation and surgical planning in atypical localizations.

In the literature, hydatid cysts with atypical localizations are well known to present significant diagnostic challenges due to non-specific imaging findings and frequent radiological overlap with simple cysts, abscesses, or cystic neoplasms, particularly in retroperitoneal, muscular, and soft tissue locations (6,7). Several authors have emphasized that characteristic imaging features, such as daughter cysts or calcified membranes, are inconsistently observed outside the liver; definitive preoperative diagnosis is often not possible, even in endemic regions.

Consistent with these reports, imaging findings in our series were heterogeneous; retrospective WHO-IWGE classification was feasible in only 30% of cases, with the majority demonstrating non-specific cystic appearances. In line with previous case series and reviews, USG proved useful for superficial and soft tissue lesions, whereas CT and magnetic resonance imaging were essential for assessing deep-seated lesions and their relationship to adjacent anatomical structures (6,7). Our findings support existing literature demonstrating that imaging alone is frequently insufficient for definitive diagnosis of atypically localized hydatid cysts, and that surgical decision-making often relies on a combination of clinical suspicion, endemic exposure, serology, and intraoperative findings.

Due to the heterogeneity of atypical localizations and the predominance of case reports and small series in the literature, comparable quantitative data on the proportion of lesions that meet WHO-IWGE imaging criteria are not clearly defined, limiting direct numerical comparison with previously published studies.

In our study, 5 out of 10 cases [gluteus, rectus, psoas, anterior abdominal wall (subcutaneous), and medial thigh, each accounting for 1.17%] were localized in musculoskeletal soft tissue. Primary soft-tissue involvement by hydatid cysts is rare, even in endemic regions, with an incidence of approximately 0.5-4.7%. Primary muscular hydatid disease is even rarer. All 5 cases in our study were primary, with no associated liver disease. One case involved a hydatid cyst in the skin and subcutaneous tissue. Subcutaneous tissue involvement has been described in 1.5% of hydatidosis cases, with a reported range of 0.6-2.6%. In the differential diagnosis of slowly growing masses in soft tissues, solitary subcutaneous hydatid cysts should always be considered (8-10).

In our study, three cases demonstrated retroperitoneal location, including lesions that were adjacent to the ureter and bladder, posterior to the bladder, or at the T12-L1 vertebral level. In the literature, retroperitoneal hydatid cysts are reported to constitute approximately 6-16% of cases, while pelvic hydatid cysts are considerably rarer, with an incidence of around 2.25% (6,8). Bone involvement, most commonly affecting the spine, accounts for 0.5-2.5% of hydatid cyst cases (11,12). The coexistence of retroperitoneal and spinal hydatid cysts, observed in one of our patients, is consistent with these rare but recognized patterns of dissemination described in previous studies.

Notably, only two patients in our series had concomitant hepatic hydatid cysts, whereas the remaining cases represented primary extrahepatic disease. This finding contrasts with most published series, in which secondary involvement following hepatic disease predominates, and suggests a relatively higher proportion of primary atypical localizations in our cohort (3,8). Such variation may reflect the small size and selective nature of retrospective series focusing specifically on atypical presentations.

In addition, our series included hydatid cysts located in exceptionally rare sites, such as the adrenal gland and adnexal organs. These localizations are considered extraordinary and have been documented almost exclusively through isolated case reports in the literature (13,14). The presence of such rare localizations further supports the hypothesis that alternative dissemination mechanisms, including hematogenous or lymphatic spread, may play a role in the pathogenesis of primary extrahepatic hydatid disease (15,16).

Table 2. Diagnostic imaging characteristics, surgical indications, and recurrence patterns of atypically localized hydatid cysts

Case no	Imaging modality	Dimension (cm)	Imaging appearance	WHO-IWGE	Features suggestive of HC	Indication for surgery	Recurrence
Case 1	USG	5.5x3	Cystic lesion located between the gluteal muscle groups with imaging features compatible with a type 3 hydatid cyst	CE3	Positive serology, endemic area, intramuscular localization, typical hydatid fluid and germinative membrane intraoperatively	Symptomatic mass and imaging findings suspicious for hydatid cyst	Present-MRI, rectum-bladder region, CE3
Case 2	CT	5x6	Multiloculated cystic lesion within the right rectus muscle	None	Deep muscular localization, endemic area, intraoperative findings compatible with hydatid cyst, histopathology consistent with hydatid disease	Symptomatic lesion with imaging suspicion for hydatid cyst despite negative serology	None
Case 3	CT	10x9	Well-defined, septated cystic lesion in the left pelvic region (ovarian fossa), adjacent to the ureter-bladder	None	Positive serology, endemic area, pelvic localization, intraoperative findings compatible with hydatid cyst, histopathology consistent with hydatid disease	Symptomatic pelvic mass with indeterminate imaging findings, including possible cystic neoplastic pathology in the differential diagnosis	None
Case 4	CT	6x5	Well-defined mass-like cystic lesion in the right retroperitoneal paravertebral region, posterior to the kidney, with adjacent rib destruction	None	Positive serology, endemic area, retroperitoneal localization, intraoperative findings of vesicular hydatid cyst content	Symptomatic retroperitoneal lesion with indeterminate imaging findings and concern for invasive pathology	Present-CT, retroperitoneum
Case 5	CT	5x6	Septated hypodense cystic lesion in the right adnexal region, located between the bladder and uterus	None	Positive serology, endemic area, adnexal localization, imaging suspicion for hydatid cyst, intact cyst removal intraoperatively, histopathology consistent with hydatid disease	Symptomatic adnexal cystic mass with imaging findings suspicious for hydatid cyst	None
Case 6	USG	4x3	Hypoechoic lesions in the posterior segment of the right hepatic lobe with indeterminate internal structure, with concomitant cystic lesions in the right adrenal gland	None	Positive serology, endemic area, intraoperative findings of vesicular hydatid cyst content in the liver, two hydatid cysts in the right adrenal gland confirmed intraoperatively, histopathology consistent with hydatid disease	Symptomatic upper quadrant pain with indeterminate imaging findings and intraoperative confirmation of hydatid disease involving the liver and adrenal gland	None
Case 7	USG	7x5.5	Cystic lesion located posterior to the bladder with concomitant hepatic cystic lesion, with imaging features compatible with type 3 hydatid cyst	CE3	Positive serology, endemic area, pelvic localization, imaging features compatible with type 3 hydatid cyst, intraoperative findings consistent with hydatid disease, histopathology confirming hydatid cyst	Symptomatic lower quadrant pain with imaging findings compatible with hydatid cyst and involvement of both hepatic and posterior bladder regions	None

Table 2. Continued

Case no	Imaging modality	Dimension (cm)	Imaging appearance	WHO-IWGE	Features suggestive of HC	Indication for surgery	Recurrence
Case 8	USG	6x4	Hypoechoic cystic lesion located between the subcutaneous fat and muscle tissue in the medial thigh, with a small adjacent nodular cystic component	None	Positive serology, endemic area, soft tissue localization, imaging suspicion for hydatid cyst, intraoperative findings consistent with infected hydatid cyst	Symptomatic soft tissue mass with indeterminate imaging findings and suspicion of hydatid cyst	None
Case 9	USG	4.5x2	Subcutaneous cystic lesion in the left upper abdominal anterior wall with multivesicular anechoic components and a heterogeneous thick wall	CE2	Positive serology, endemic area, subcutaneous abdominal wall localization, imaging features of multivesicular cyst, intraoperative findings compatible with hydatid cyst	Symptomatic anterior abdominal wall cystic lesion with imaging findings highly suggestive of hydatid cyst	None
Case 10	CT	15x7	Large cystic lesion surrounding the left psoas muscle	None	Positive serology, endemic area, deep muscular (psoas) localization, imaging suspicion for hydatid cyst, intraoperative findings compatible with hydatid cyst	Symptomatic retroperitoneal muscular mass with indeterminate imaging findings suspicious for hydatid cyst	None

WHO-IWGE: World Health Organization-Informal Working Group on Echinococcosis, HC: Hydatid cyst, USG: Ultrasonography, CT: Computed tomography, MRI: Magnetic resonance imaging

In our study, total cyst excision was performed in 8 cases, while cystotomy and drainage were conducted in 2 cases. The gold-standard treatment for hydatid cysts is complete excision; preventing rupture and spillage during the procedure is critical. The greatest associated risk is anaphylactic shock. No surgical complications were reported in the selected cases. In one of the two cases in which total excision was not feasible, the cyst was retroperitoneal and associated with the vertebrae. In the other case, the cyst was subcutaneous. In both cases, cystotomy and drainage were performed.

In the present series, recurrence patterns differed between the two affected patients. One recurrence occurred four months after complete excision (cystectomy) of a right gluteal intramuscular hydatid cyst, manifesting as a new lesion in a different anatomical region (retroperitoneal). The second recurrence, which developed in the same anatomical location, was detected two years after an initial non-radical procedure (drainage and curettage) performed for a retroperitoneal hydatid cyst with vertebral involvement. These findings suggest that recurrence in hydatid disease may occur both as an early manifestation at a different site, despite complete excision, and as a late local recurrence following non-radical surgical approaches, particularly in anatomically complex regions. However, due to the limited number of cases and the retrospective design of the study, no definitive conclusions regarding the relationship between surgical technique and recurrence risk can be drawn.

The gold-standard drug for adjuvant therapy is albendazole, administered at a dose of 10-15 mg/kg/day for 1-6 months. In our study, 3 cases received preoperative albendazole, and all cases were treated with postoperative albendazole for a minimum of 3 months (3).

Recurrence was observed in 2 cases (20%). In one case, a hydatid cyst was identified in the retroperitoneum two years after excision of a right gluteal cyst. This was considered a recurrence because of the patient's prior history and was managed surgically. The other recurrence occurred in a case of a retroperitoneal cyst associated with the vertebrae that was initially treated with cystotomy. Notably, both cases of recurrence had received albendazole therapy preoperatively and postoperatively. In the literature, recurrence rates for hydatid disease vary widely depending on the localization of the cysts, ranging from 0% to 50% (11,17). In ruptured hepatic cysts specifically, recurrence and serious complications such as bile leakage and anaphylaxis have also been reported, supporting the need for long-term follow-up and adjuvant therapy (18).

Study Limitations

The retrospective design and the limited number of cases represent important limitations of this study. However,

these limitations are largely attributable to the inherent rarity of hydatid cysts in atypical locations. To maintain a focused and clinically meaningful cohort, splenic and pancreatic hydatid cysts, which are relatively more frequently reported after hepatic and pulmonary involvement, were deliberately excluded to emphasize truly uncommon sites.

Despite the small sample size, many of the cases included in this series represent exceptionally rare localizations, each of which could be considered noteworthy even as an individual case in the literature. The principal strength of this study lies in the systematic aggregation and comparative analysis of these rare presentations within a single cohort, providing a concise and clinically relevant overview of diagnostic challenges, surgical strategies, and outcomes in atypically localized hydatid disease.

Our findings underscore the considerable diagnostic difficulties associated with hydatid cysts in unusual anatomical locations, which are consistent with previous reports. A high index of suspicion remains essential for preoperative diagnosis, and in endemic regions, hydatid disease should be included in the differential diagnosis of cystic masses with atypical localization or indeterminate imaging features. In our practice, albendazole therapy was administered both preoperatively and postoperatively according to institutional protocol, and long-term follow-up proved critical, as recurrence may occur months to years after initial surgery. These observations highlight the importance of combined surgical and medical management and prolonged surveillance in patients with atypically localized hydatid cysts.

In the future, digital health tools and IoT-based follow-up systems may contribute to long-term surveillance and early detection of recurrence, particularly in patients with atypically localized hydatid cysts requiring prolonged monitoring (19).

Conclusion

This retrospective case series demonstrates that hydatid cysts in atypical locations have a wide anatomical distribution and may be associated with a considerable risk of postoperative recurrence, particularly when complete cyst excision cannot be achieved. Musculoskeletal and retroperitoneal localizations were the most frequently observed atypical sites. Careful preoperative evaluation and radical surgical excision, when feasible, appear to be critical in reducing recurrence and the need for reoperation. Surgeons should maintain a high index of suspicion for atypically localized hydatid cysts, especially in endemic regions, to ensure timely diagnosis and appropriate surgical management.

Ethics

Ethics Committee Approval: This study received approval from the Süleyman Demirel University Health Sciences Ethics Committee (approval number: 7, date: 06.01.2025).

Informed Consent: Because the study was designed retrospectively no written informed consent form was obtained from the patients.

Footnotes

Authorship Contributions

Surgical and Medical Practices: M.Z.S., İ.S., Concept: B.T., Design: İ.S., B.T., S.A., Data Collection or Processing: İ.S., B.T., A.B.E., Analysis or Interpretation: B.T., İ.K., A.B.E., Literature Search: M.Z.S., S.A., İ.K., Writing: M.Z.S., İ.S., B.T., S.A., İ.K., A.B.E.

Conflict of Interest: The authors declare that there is no conflict of interest.

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