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ISOLATED CERVICAL CYSTICERCOSIS PRESENTING AS A CYSTIC NECK MASS MIMICKING A LYMPHATIC CYST: A RARE CASE REPORT WITH REVIEW OF LITERATURE

Histopathology

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ABSTRACT

Background: Cysticercosis is a parasitic tissue infestation caused by the larval stage (Cysticercus cellulosae) of the pork tapeworm Taenia solium. Although neurocysticercosis is its most common manifestation, isolated cervical involvement is extremely uncommon and often mimics benign cystic lesions of the neck, making preoperative diagnosis difficult. **Case Presentation:** A 41-year-old man presented with a painless, gradually enlarging swelling over the right side of the neck of one year's duration. Clinical examination demonstrated a cystic swelling involving the posterior triangle of the neck. Ultrasonography, computed tomography, and magnetic resonance imaging suggested a benign cystic lesion, with lymphangioma considered the most likely diagnosis. Surgical exploration revealed a deep-seated cyst closely related to the brachial plexus and extending beneath the clavicle. Inadvertent intraoperative rupture of the cyst released multiple daughter cyst-like structures, initially raising suspicion of hydatid disease. Complete surgical excision was performed, and histopathological examination unexpectedly confirmed cysticercosis. Postoperative magnetic resonance imaging of the brain and ophthalmological evaluation excluded disseminated disease. The patient received postoperative albendazole and praziquantel therapy and had an uneventful recovery. **Conclusion:** Isolated cervical cysticercosis should be considered in the differential diagnosis of cystic neck masses, particularly in endemic regions. Histopathological examination remains the definitive diagnostic method, while complete surgical excision provides both diagnosis and definitive treatment.

KEYWORDS

Cysticercosis; Neck Swelling; Posterior Triangle; Taenia Solium; Lymphangioma

INTRODUCTION

Cysticercosis is a tissue infestation caused by the larval stage (Cysticercus cellulosae) of the pork tapeworm Taenia solium. It remains one of the most common parasitic zoonotic infections worldwide and continues to be an important public health problem in many low- and middle-income countries, where poor sanitation, inadequate personal hygiene, and faecal–oral transmission facilitate infection [1-4].

Humans are the definitive hosts of the adult intestinal tapeworm, whereas pigs serve as the natural intermediate host. Human cysticercosis develops following accidental ingestion of T. solium eggs through contaminated food or water, or through autoinfection in individuals harbouring the adult intestinal tapeworm. After ingestion, the eggs hatch within the small intestine, releasing oncospheres that penetrate the intestinal mucosa and disseminate haematogenously to various tissues, where they develop into viable cysticerci [2,5,6].

The clinical manifestations of cysticercosis depend on the number, location, size, and developmental stage of the larvae. The central nervous system is the site most frequently affected, producing neurocysticercosis, which is recognised as one of the leading causes of acquired epilepsy in endemic countries [6-8]. Other commonly affected sites include skeletal muscle, subcutaneous tissue, the eye, the orbit, the heart, and other visceral organs [1,2]. Isolated involvement of the cervical soft tissues is distinctly uncommon and therefore frequently presents a diagnostic challenge. Patients usually present with a painless, slowly enlarging neck swelling that clinically resembles a branchial cleft cyst, lymphangioma, dermoid cyst, epidermoid cyst, tuberculous lymphadenitis, cold abscess, or cystic metastatic lymph node [9-12]. Owing to this nonspecific clinical presentation, establishing a definitive diagnosis before surgery is often difficult.

Ultrasonography (USG) is usually the first imaging modality used for evaluation and may occasionally demonstrate the characteristic eccentric echogenic scolex within the cyst, although this finding is not present in every patient. Computed tomography (CT) and magnetic resonance imaging (MRI) are valuable for determining the anatomical extent of the lesion and its relationship to adjacent neurovascular structures, but their findings frequently overlap with those of other benign cystic neck lesions [8,9,11]. Consequently, histopathological examination remains the gold standard for definitive diagnosis [10,13].

Management depends on the anatomical location and extent of disease. Neurocysticercosis is generally treated with antiparasitic therapy, corticosteroids, and antiepileptic drugs where indicated. In contrast, isolated symptomatic soft-tissue lesions are generally managed by complete surgical excision, which provides both definitive diagnosis and treatment while preventing local recurrence [8,14].

Despite the high prevalence of cysticercosis in endemic countries, isolated cervical involvement remains rare, with relatively few cases reported in the literature. The rarity of this presentation, together with its nonspecific clinical and radiological appearance, frequently results in delayed or incorrect preoperative diagnosis [9-11].

We report the case of a 41-year-old man who presented with a gradually progressive, painless swelling in the right posterior triangle of the neck. Clinical examination and multimodality imaging suggested a benign lymphatic cyst; however, complete surgical excision followed by histopathological examination established a diagnosis of isolated cervical cysticercosis. This case highlights the diagnostic challenges, key intraoperative findings, and the role of histopathology, and underscores the need to consider parasitic disease in the differential diagnosis of cystic neck masses in endemic regions.

Case Presentation

A 41-year-old man presented to the Department of General Surgery with a one-year history of gradually progressive swelling over the right side of the neck. The swelling was insidious in onset and had progressively increased in size. There was no associated pain, fever, dysphagia, odynophagia, hoarseness of voice, respiratory difficulty, weight loss, anorexia, or other constitutional symptoms. The patient reported no previous neck trauma or similar swellings elsewhere in the body.

His past medical history was unremarkable, with no history of diabetes mellitus, hypertension, coronary artery disease, bronchial asthma, chronic kidney disease, epilepsy, tuberculosis, or thyroid disorder. Approximately twenty years earlier, he had undergone excision of a scrotal cyst without postoperative complications. Family history was non-contributory, with no known parasitic disease among close relatives.

General physical examination revealed a conscious, alert, and well-oriented patient with stable vital signs. There was no pallor, icterus, cyanosis, clubbing, pedal oedema, or generalised lymphadenopathy.

Cardiovascular, respiratory, abdominal, and neurological examinations were within normal limits.

Local examination demonstrated a diffuse cystic swelling measuring approximately 4 × 4 cm in the right posterior cervical triangle, extending inferiorly toward the supraclavicular region. The overlying skin was normal, without erythema, ulceration, pigmentation, dilated veins, or sinus formation. On palpation, the swelling was non-tender, fluctuant, cystic in consistency, and mildly mobile, with indistinct margins; the overlying skin was freely pinchable, and there was no local rise in temperature or surrounding induration. Cervical lymph nodes were not clinically enlarged, and examination of the oral cavity and cranial nerves was unremarkable.

A provisional diagnosis of a benign cystic neck lesion was made, with lymphangioma as the principal clinical differential. Other considerations included branchial cleft cyst, dermoid cyst, epidermoid cyst, cystic schwannoma, tuberculous cold abscess, and cystic metastatic lymphadenopathy. Further radiological evaluation was undertaken to define the nature and extent of the lesion before definitive surgical management.

Investigations

Routine laboratory investigations — complete blood count, renal and liver function tests, serum electrolytes, coagulation profile, fasting blood glucose, and urinalysis — were within normal limits. Preoperative electrocardiography, chest radiography, and two-dimensional echocardiography showed no significant abnormality. The patient was evaluated by the Department of Anaesthesiology, classified as American Society of Anesthesiologists (ASA) Physical Status Grade I, and was deemed fit for surgery under general anaesthesia.

Ultrasonography

Ultrasonography of the neck demonstrated a well-defined cystic lesion measuring approximately 5.5 × 5.2 × 4.1 cm in the right supraclavicular region, with peripheral vascularity and no internal calcification or solid mural nodules. Mild enlargement of bilateral level IB cervical lymph nodes was also noted. Based on this sonographic appearance, the lesion was interpreted as a benign lymphatic malformation (lymphangioma).

Although ultrasonography is the first-line imaging modality for superficial neck masses and may occasionally demonstrate an eccentric echogenic scolex characteristic of cysticercosis, this classical finding is absent in many patients, which limits the specificity of sonography in isolated soft-tissue disease [9-11].

Computed Tomography

Contrast-enhanced computed tomography demonstrated a well-circumscribed, low-attenuation cystic lesion occupying the right posterior cervical triangle with inferior extension toward the supraclavicular fossa. No adjacent bony destruction, vascular invasion, or abnormal cervical lymphadenopathy was identified. The lesion appeared benign; however, the imaging findings were not sufficiently specific to establish a definitive diagnosis.

Computed tomography is valuable for evaluating the anatomical extent of deep cervical lesions and excluding invasion of adjacent structures, but its imaging features frequently overlap with those of branchial cysts, lymphangiomas, and other benign cystic lesions [6,8].

Magnetic Resonance Imaging

Magnetic resonance imaging (MRI) was performed to better define the relationship of the lesion to the surrounding neurovascular structures. It demonstrated a well-defined cystic mass occupying the posterior cervical triangle with inferior extension beneath the clavicle (Figures 1 and 2). The lesion was hypointense on T1-weighted images and hyperintense on T2-weighted images, consistent with a fluid-containing cystic lesion, with no evidence of infiltration into adjacent muscles or major vascular structures.

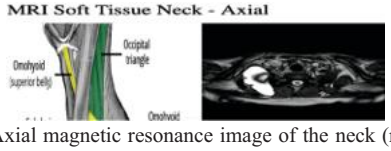

Figure 1. Axial magnetic resonance image of the neck (right panel) demonstrating a well-defined, fluid-signal cystic lesion in the right posterior cervical region, shown alongside a schematic reference diagram of the posterior (occipital) triangle for anatomical orientation (left panel).

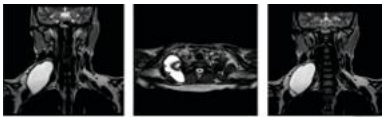

Figure 2. Coronal (A, C) and axial (B) magnetic resonance images showing a well-defined, T2-hyperintense cystic lesion in the right posterior cervical triangle extending inferiorly toward the supraclavicular fossa.

Although MRI provides excellent soft-tissue contrast and facilitates preoperative surgical planning, isolated cervical cysticercosis lacks pathognomonic MRI features, and differentiation from other benign cystic neck lesions remains difficult [6,8,9].

Differential Diagnosis

Based on the clinical examination and imaging findings, the following differential diagnoses were considered:

1. Lymphangioma (lymphatic cyst),
2. Second branchial cleft cyst,
3. Dermoid cyst
4. Epidermoid cyst,
5. Cystic schwannoma,
6. Tuberculous cold abscess,
7. Cystic metastatic cervical lymph node,
8. Hydatid cyst and
9. Soft-tissue cysticercosis

Despite comprehensive clinical assessment and multimodality imaging, a definitive preoperative diagnosis could not be established. Given the progressive increase in size, deep anatomical location, and close relationship of the lesion to major neurovascular structures, complete surgical excision was planned to establish the diagnosis and provide definitive treatment.

Surgical Procedure

After completion of the preoperative evaluation and written informed consent, the patient was scheduled for elective surgical excision under general anaesthesia. He was positioned supine with a sandbag beneath the shoulders to achieve adequate neck extension, with the head rotated to the contralateral (left) side to improve exposure of the right posterior cervical triangle. Standard aseptic precautions were observed throughout the procedure.

A transverse cervical skin incision was made directly over the swelling. The skin, subcutaneous tissue, and platysma were divided sequentially, and superior and inferior subplatysmal flaps were elevated. Careful dissection through the superficial cervical fascia exposed a well-encapsulated cystic lesion occupying the posterior cervical triangle.

The lesion was mobilised using a combination of blunt and sharp dissection. Intraoperatively, the cyst was found to extend deeply toward the transverse process of the sixth cervical vertebra (C6) posteriorly and inferiorly beneath the clavicle into the supraclavicular region. It was densely adherent to the surrounding soft tissues and maintained a close relationship with the brachial plexus, necessitating meticulous dissection to avoid iatrogenic neurological injury (Figure 3).

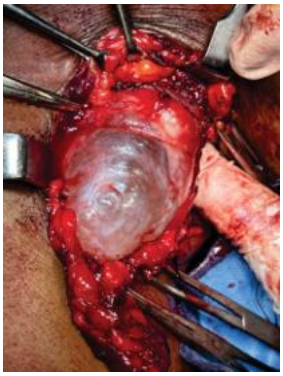

Figure 3. Intraoperative photograph showing a well-encapsulated,

translucent cystic lesion within the posterior cervical triangle, closely related to the surrounding neurovascular structures prior to excision.

During mobilisation of the inferior aspect of the lesion, inadvertent rupture of the cyst occurred, releasing clear cystic fluid containing multiple small cystic structures. This intraoperative appearance raised suspicion of a parasitic cyst, and hydatid disease was considered among the differential diagnoses. As a precautionary measure, the operative field was isolated with sterile gauze, the cyst cavity was irrigated with povidone–iodine solution, and thorough saline lavage was performed before further dissection.

Following decompression, the remaining cyst wall was meticulously dissected from the surrounding tissues with preservation of the brachial plexus and adjacent vascular structures. Complete excision of the lesion was achieved without injury to the surrounding neurovascular structures. Haemostasis was secured, the operative field was irrigated, and a closed suction drain was placed in the operative bed. The wound was closed in layers, using absorbable sutures for the deeper tissues and interrupted non-absorbable sutures for the skin.

The excised specimen was immediately submitted for histopathological examination to establish the definitive diagnosis. Complete surgical excision remains the preferred management for isolated soft-tissue cystic lesions when the diagnosis is uncertain, as it provides both definitive treatment and tissue for pathological confirmation [8,14].

Histopathological Examination

The excised specimen was submitted for gross and microscopic histopathological examination. Gross examination revealed an already-opened cystic specimen measuring approximately 6.0 × 2.0 × 0.6 cm, with a smooth, glistening external surface and a thin, translucent cyst wall. The cut surface demonstrated a collapsed cystic cavity without solid mural nodules, haemorrhage, or necrosis.

Microscopic examination of haematoxylin- and eosin-stained sections demonstrated features characteristic of cysticercosis: a fibrocollagenous cyst wall enclosing degenerating parasitic structures, surrounded by dense chronic inflammatory infiltration (Figures 4 and 5). The infiltrate consisted predominantly of lymphocytes, plasma cells, eosinophils, and histiocytes, with occasional foreign-body giant cells. Focal fibrosis and a chronic granulomatous reaction were also identified, with no evidence of dysplasia or malignancy.

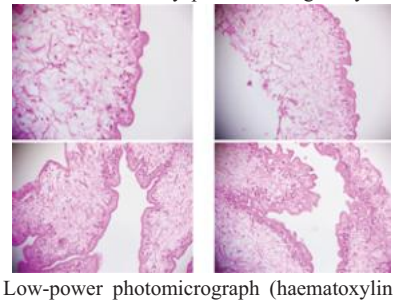

Figure 4. Low-power photomicrograph (haematoxylin and eosin) showing the part of the cystwall

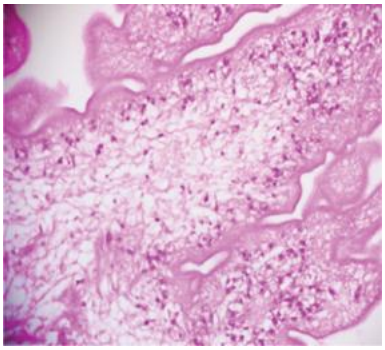

Figure 5. High-power photomicrograph (haematoxylin and eosin) showing the cyst wall

On the basis of these characteristic morphological features, a diagnosis of isolated cervical cysticercosis caused by the larval stage of Taenia solium was confirmed [6,12,13].

Postoperative Management

The postoperative course was uneventful. The patient remained haemodynamically stable and did not develop neurological deficit, haematoma, seroma, wound infection, or vascular complications. The closed suction drain was removed after satisfactory reduction in output, and the surgical wound healed by primary intention.

Following histopathological confirmation of cysticercosis, further evaluation was undertaken to exclude disseminated disease. Postoperative magnetic resonance imaging of the brain (Figures 6 and 7) showed no evidence of neurocysticercosis, and a follow-up MRI of the neck (Figure 8) showed no residual or recurrent lesion. Detailed ophthalmological examination excluded ocular involvement.

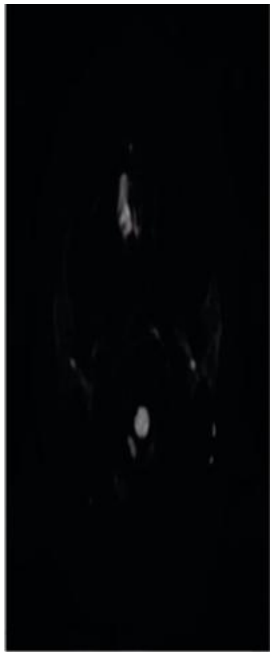

Figure 6. Postoperative axial MRI of the brain showing no abnormal signal to suggest neurocysticercosis.

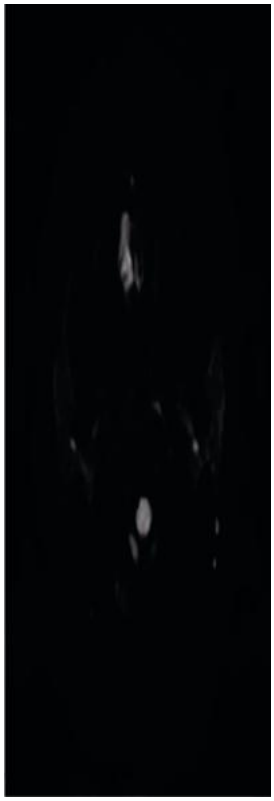

Figure 7. Postoperative axial MRI of the brain at a further level, again showing no evidence of neurocysticercosis.

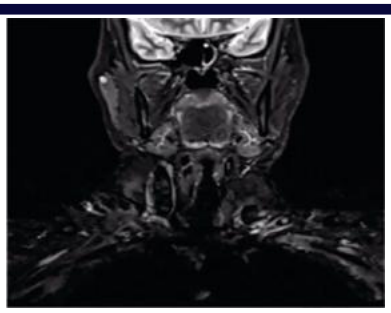

Figure 8. Postoperative coronal MRI of the neck showing no residual or recurrent lesion.

These investigations confirmed that the lesion represented isolated cervical soft-tissue cysticercosis [8,15].

The patient subsequently received oral albendazole (800 mg/day) together with praziquantel (600 mg, administered on a 2–2–1 dosing schedule) for a total duration of 28 days. Although complete surgical excision had been achieved, postoperative antiparasitic therapy was administered to minimise the possibility of occult residual infection, in accordance with institutional clinical practice [8,14].

The patient was reviewed periodically in the outpatient clinic. Follow-up demonstrated satisfactory wound healing, with no clinical evidence of recurrence, neurological impairment, or additional systemic manifestations of cysticercosis.

DISCUSSION

Human cysticercosis is a parasitic zoonosis caused by the larval stage (Cysticercus cellulosae) of Taenia solium. It continues to be a significant public health concern in many developing countries, where inadequate sanitation, poor personal hygiene, and close human–pig interaction facilitate transmission [1-4]. Humans acquire cysticercosis through ingestion of T. solium eggs rather than through consumption of pork. Following ingestion, oncospheres penetrate the intestinal wall and disseminate haematogenously to various tissues, where they develop into cysticerci [5,6].

The central nervous system is the site most frequently affected, resulting in neurocysticercosis, one of the leading causes of acquired epilepsy worldwide[6-8]. Other commonly involved sites include skeletal muscle, subcutaneous tissue, ocular structures, and the orbit. Isolated involvement of the cervical soft tissues remains extremely uncommon and therefore frequently presents a diagnostic challenge for surgeons, radiologists, and pathologists alike [9-11].

The clinical presentation of cervical cysticercosis is usually nonspecific. Most patients present with a slowly enlarging, painless neck mass without constitutional symptoms, and lesions are frequently mistaken for branchial cleft cysts, lymphangiomas, dermoid cysts, epidermoid cysts, tuberculous lymphadenitis, cold abscesses, or cystic metastatic cervical lymph nodes [9-11]. Similar diagnostic uncertainty was encountered in the present case, in which both clinical examination and multimodality imaging favoured a benign lymphatic cyst.

Radiological investigations play an essential role in preoperative planning but frequently fail to establish the diagnosis. Ultra-sonography may demonstrate the characteristic eccentric echogenic scolex, although this classical finding is absent in many patients [9,11]. Computed tomography and magnetic resonance imaging accurately define lesion extent and anatomical relationships but often show appearances that overlap with those of other benign cystic neck lesions [6,8]. In the present case, MRI was particularly valuable in demonstrating the relationship of the lesion to the posterior cervical triangle and surrounding neurovascular structures, thereby facilitating operative planning.

A notable feature of this case was the unusual anatomical extent of the lesion, which extended posteriorly toward the transverse process of C6 and inferiorly beneath the clavicle while remaining closely related to the brachial plexus. This anatomical relationship considerably increased the complexity of surgical excision and underscored the importance of meticulous dissection to avoid neurological injury.

Intraoperative rupture of the lesion revealed multiple small cystic structures suspended in clear fluid. Although this appearance initially raised suspicion of hydatid disease, a definitive diagnosis could not be established intraoperatively — a finding that underscores that macroscopic appearance alone may occasionally be misleading, and that histopathological examination remains the definitive diagnostic modality [12,13].

Histopathological examination confirmed the diagnosis of cysticercosis. Following confirmation, MRI of the brain and detailed ophthalmological evaluation excluded associated neurocysticercosis and ocular involvement, confirming an isolated cervical presentation [8,15]. This evaluation is clinically important, as disseminated disease requires a different therapeutic approach and carries a different prognosis.

The optimal management of isolated soft-tissue cysticercosis remains debated. While antiparasitic therapy with albendazole or praziquantel may be effective in selected patients, complete surgical excision is generally recommended for symptomatic lesions, lesions causing diagnostic uncertainty, or lesions situated adjacent to major neurovascular structures [8,14]. Surgical excision not only provides definitive treatment but also permits histopathological confirmation of the diagnosis. In our patient, complete excision followed by postoperative antiparasitic therapy resulted in an uneventful recovery without clinical recurrence during follow-up.

A review of the available literature indicates that isolated cervical cysticercosis remains a distinctly uncommon clinical entity. Most published cases involve small subcutaneous lesions or anterior cervical swellings, whereas lesions arising within the posterior triangle in close proximity to the brachial plexus are rarely described [9-11]. The present case therefore adds to the limited body of literature describing this unusual anatomical presentation and highlights the importance of considering cysticercosis in the differential diagnosis of cystic neck masses in endemic regions.

Overall, this case reinforces three clinical messages: (i) isolated cervical cysticercosis should remain a differential diagnosis of painless cystic neck swellings; (ii) imaging studies are valuable for defining anatomical extent but may not establish the diagnosis; and (iii) complete surgical excision followed by histopathological confirmation remains the cornerstone of diagnosis and management in selected patients.

CONCLUSION

Isolated cervical cysticercosis is a rare manifestation of Taenia solium infection and represents an important diagnostic challenge, as its clinical and radiological features closely mimic other benign cystic lesions of the neck. As demonstrated in the present case, preoperative evaluation with ultrasonography, computed tomography, and magnetic resonance imaging may accurately define the anatomical extent of the lesion but may not establish a definitive diagnosis [6,8,11].

Complete surgical excision remains an effective diagnostic and therapeutic approach for isolated cervical lesions, particularly when the diagnosis is uncertain or when the lesion is closely related to major neurovascular structures. Histopathological examination continues to be the gold standard for confirming cysticercosis and should be performed for all excised cystic neck lesions with atypical clinical or intraoperative findings [12,13].

Following confirmation of the diagnosis, patients should undergo appropriate evaluation to exclude associated neurocysticercosis and ocular involvement, as these conditions significantly influence clinical management and long-term prognosis [7,8,14].

This case emphasises the importance of including isolated cervical cysticercosis in the differential diagnosis of painless cystic neck masses in endemic regions. Careful clinical assessment, appropriate radiological evaluation, meticulous surgical dissection, definitive histopathological confirmation, and suitable postoperative antiparasitic therapy together contribute to excellent clinical outcomes.

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