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Isolated cysticercosis of muscle: A case series of a rare diagnosis

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Abstract

Cysticercosis is caused by the larval form of *Taenia solium*. The sources for the infection are poor sanitation, consumption of undercooked infected pork and raw vegetables contaminated by human faeces. India is one of the endemic countries where the parasite is prevalent in many states and Cysticercosis can involve various organs. This study aimed to analyze and report cases of isolated cysticercosis of muscle. This is a retrospective study that included cases which had been reported as cysticercosis from March 2024 to September 2024 at our tertiary care hospital and surgically excised. The clinical presentation of these cases along with microscopic and macroscopic features were reviewed. There were three cases of isolated cysticercosis of muscle that were surgically excised during the study period. Among them, two cases were intramuscular lesions of biceps, one case was intramuscular lesion of masseter muscle. On histopathological evaluation, the cross section of the cysticercus was seen in all cases with associated inflammatory changes. To conclude, cysticercosis can clinically present as a benign neoplastic or an inflammatory lesion. Microscopic findings dictate the diagnosis of cysticercosis. Medical management can cure the disease but if the patient is having severe pain and tenderness with difficulty in carrying daily routine activities, it is always recommended to excise the cyst as surgery is one-time procedure with appropriate results.

Keywords: Cysticercus, conclude, muscle

Introduction

Cysticercosis is most commonly seen in developing countries like India. It is caused by the larval stage of *Taenia solium*. Man is both definitive and intermediate host [1]. Cysticercosis is mostly common in people who lives in poor sanitary or unhygienic conditions and consume undercooked pork [2]. Cases are reported in developed countries due to immigration of people from endemic countries carrying *Taenia solium*. Neurocysticercosis is most common disease caused by *Taenia solium* and involvement of skeletal muscles is very rare [3]. There have been cases reported in various skeletal muscles in literature but it is always a challenge for the treating doctor to diagnose it due to its varied presentations and with few cases even reported among vegetarians [4].

Case Presentation

Case 1: A 34-year-old male, property dealer by occupation, resident of Delhi, came to the Surgery OPD of World College of Medical Science and Research, Jhajjar with the chief complaints of swelling of the left arm from past 2 months. It was insidious in onset and non-progressive in nature (Fig. 1A). There was no trauma to the limb and no similar swellings elsewhere in the body. Initially swelling was painless then patient started having severe pain whenever he use to lift heavy weights or did twisting movements of the arm. Relieved by rest and analgesics. There was no comorbidities. He was a non-vegetarian occasional smoker and alcoholic. No similar complaints in the family.

On Examination: There was swelling in anterior aspect of left arm. No local raise of temperature. Mild Tenderness present. Swelling site changed on flexion of left elbow joint. Skin over the swelling is pinchable.

Ultrasonography (Local): Showed A well-defined ovoid tender cystic lesion with thin walls seen in upper left arm muscles (biceps) measuring 3 x 2 x 2 cm? myocysticercosis. A tiny 4mm central mural nodule/ calcification seen. (Fig. 2).

Investigations

CBC

Hb- 12.7g/dl
TLC – 9100
Platelet count - 150x 10⁹/L
ESR- 18.

Renal profile

Blood urea - 27.1 mg/ dl
S. Creatinine – 0.78 mg/dl

Liver function test

Bilirubin (T) – 0.92 mg/dl
Bilirubin (D) – 0.41 mg/dl
Bilirubin (I) – 0.51 mg/dl
S.G.O.T – 73.2 IU/L
S.G.P.T – 52.0 IU/L
ALP – 96 IU/L

Lipid profile

T. Cholesterol – 209 mg/dl
Triglyceride – 142.4 mg/dl
HDL – 50.6 mg/dl
LDL – 109.92 mg/dl
VLDL – 28.48 mg/dl

Blood sugar- 104 mg/dl

PT-15 sec, INR-1.17.

Viral markers

HBsAg – non – reactive
HCV-non reactive
HIV-non reactive

Urine examination - No Abnormality detected.

Physician opinion was sought who advised for a NCCT scan of brain and Ultrasound whole abdomen to rule out elsewhere in the body. All the mentioned tests were negative.

In view of severe pain, hindrance to his daily activities and as the pathology was localized to only one part of the body, it was decided to excise the mass and medical management deferred till histopathological examination of excised mass. After taking a written informed consent excision of the cyst was done.

Intraoperatively

Cyst was found embedded between the muscle fibers, and it was dissected on table which showed scolex and then the cut specimen sent for histopathological examination. (Fig 3A, 3B)

Histopathological Examination showed cysticercosis larva lined by palisading histiocytic aggregates and foreign body granuloma. Surrounding inflammatory infiltrate of lymphoplasmacytic cells with eosinophils and histiocytes (Fig. 4).

The patient started on albendazole after histopathological examination report to treat if there were any dormant cysts. Family members of the patient were also advised albendazole to eliminate carrier state and prevent recurrence. At 2-month follow-up, the patient is completely asymptomatic and doing all

his activities normally as before.

Case 2: A 50-year-old male, farmer by occupation, resident of Sampla, Jhajjar, Haryana came to the Surgery OPD of World College of Medical Science and Research, Jhajjar with the chief complaints of painful swelling of the right arm from past 15 days. It was sudden in onset and progressive in nature. There was no trauma to the limb and no similar swelling elsewhere in the body. Patient had severe pain whenever he does movements of the right arm. Not relieved by any medication. He was hypertensive. He was a non-vegetarian, smoker and non-alcoholic. No significant family history.

On Examination

There was swelling in anterior aspect of right arm. No local raise of temperature. Mild Tenderness was present. Swelling site changed on flexion of right elbow joint. Skin over the swelling is pinchable.

Ultrasonography (Local)

Showed a well defined ovoid tender cystic lesion with thin walls seen in upper right arm muscles (biceps) measuring 2.8 x 2.2 x 1.5 cm ? Myocysticercosis.

Investigations

CBC

Hb- 14g/dl
TLC – 7900
Platelet count – 200x 10⁹/L
ESR- 20.

Renal Profile

Blood urea – 25.4 mg/ dl
S. Creatinine – 0.8 mg/dl

Lipid Profile

T. Cholesterol – 232 mg/dl
Triglyceride – 132.6 mg/dl
HDL – 57.4 mg/dl
LDL – 100.62 mg/dl
VLDL – 29.88 mg/dl

Blood Sugar

89 mg/dl
PT -14.2 sec
INR-0.9

Viral Markers

HBsAg – non – reactive
HCV – non reactive
HIV – non reactive

Urine Examination-No Abnormality detected

Physician opinion was sought who advised for a NCCT scan of brain and Ultrasound whole abdomen to rule out elsewhere in the body. All the mentioned tests were negative.

In view of severe pain, hindrance to his daily activities and as the pathology was localized to only one part of the body, it was decided to excise the mass and medical management deferred till histopathological examination of excised mass. After taking a written informed consent, excision of the cyst was done.

Intraoperatively

Cyst was found embedded between the muscle fibers, and the

specimen sent for histopathological examination.

Histopathological Examination (Hpe)

Showed refractive hooklets with surrounding histiocytes with surrounding inflammatory infiltrate. (Fig. 5)

The patient started on albendazole after Histopathological Examination report to treat if there were any dormant cysts. Family members of the patient were also advised albendazole to eliminate carrier state and prevent recurrence. At 2-month follow-up, the patient is completely asymptomatic and doing all his activities normally as before.

Case 3: A 30-year-old female, housewife by occupation, resident of Jhajjar, Haryana came to the Surgery OPD of World College of Medical Science and Research, Jhajjar with the chief complaints of painful swelling of left side face from past 20 days.(Fig. 1B) It was insidious in onset and non-progressive in nature. There was no history of trauma and no similar swelling elsewhere in the body. Patient had severe pain whenever he does jaw movements. Not relieved by any medication. There were no co-morbidities. She was a vegetarian, non-smoker and non-alcoholic. No significant family history.

On Examination

There was swelling on left side of face. No local raise of temperature. Tenderness was present. Swelling site slightly changed on jaw movements. Skin over the swelling is pinchable.

Ultrasonography (Local)

Showed a cystic lesion measuring 1.6x0.8cm within intermuscular plane showing internal echogenic content, anteromedial to left mandibular ramus likely involving Masseter muscle. ?Myocysticercosis with scolex. (Fig. 6)

Investigations

CBC

Hb- 11.8g/dl
TLC – 6700
Platelet count – 180x 10⁹/L
ESR- 21.

Renal Profile

Blood urea – 19 mg/ dl
S. Creatinine – 0.7 mg/dl

Liver Function Test

Bilirubin (T) – 0.7 mg/dl
Bilirubin (D) – 0.2 mg/dl
Bilirubin (I) – 0.5 mg/dl
S.G.O.T – 27 IU/L
S.G.P.T – 14 IU/L
ALP – 66 IU/L

Lipid Profile

T. Cholesterol – 210 mg/dl
Triglyceride – 132 mg/dl
HDL – 53.1 mg/dl
LDL – 104 mg/dl
VLDL – 29 mg/dl

Blood Sugar

99 mg/dl
PT - 12.8 sec
INR - 0.9

Viral Markers

HBsAg - non - reactive
HCV - non reactive
HIV - non reactive

Urine Examination-No Abnormality detected

Mri of head and neck: T₂ hyperdense intramuscular cystic lesion involving masseter muscle, oval shaped showing smooth margins and no obvious internal solid component? Myocysticercosis. (Fig. 6)

Ultrasound whole abdomen conducted to rule out elsewhere in the body which was normal.

In view of severe pain and as the pathology was localized, it was decided to excise the mass and medical management deferred till histopathological examination of excised mass. After taking a written informed consent, excision of the cyst was done.

Intraoperatively, cyst was found embedded between the muscle fibers, and the specimen sent for histopathological examination. Histopathological Examination (Hpe) showed cysticercus with dense mixed inflammation. The patient started on albendazole after Histopathological Examination report to treat if there were any dormant cysts. Family members of the patient were also advised albendazole to eliminate carrier state and prevent recurrence. At 2-month follow-up, the patient is completely asymptomatic and doing all his activities normally as before.



Fig 1A: Pre-operative clinical picture showing swelling marked by blue marker and change of site on flexion of elbow joint.



Fig 1B: Pre-operative clinical picture showing swelling marked at left side face.



Fig 2: Ultrasonography showed A well-defined ovoid tender cystic lesion with thin walls seen in upper left arm muscles (biceps) measuring 3x2x2 cm? myocysticercosis. A tiny 4mm central mural nodule/ calcification seen.



Fig 3A: Intra-operative picture showing cyst embedded between the muscle fibers.



Fig 3B: Picture showing dissected on table.

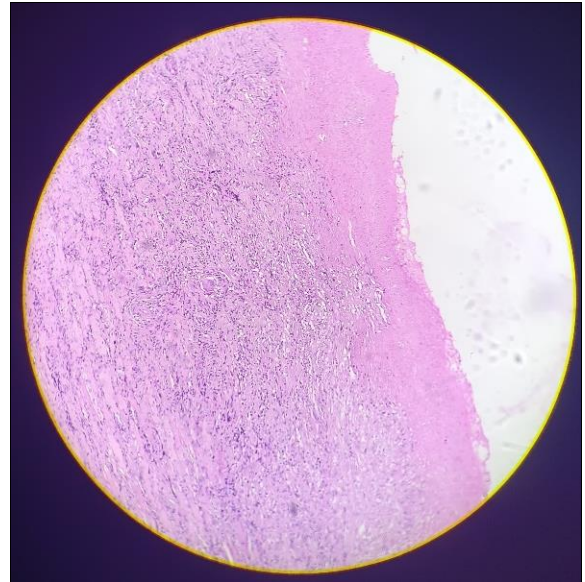


Fig 4: H&E shows cysticercosis larva lined by palisading histiocytic aggregates and foreign body granuloma. Surrounding inflammatory infiltrate of lymphoplasmacytic cells with eosinophils and histiocytes.

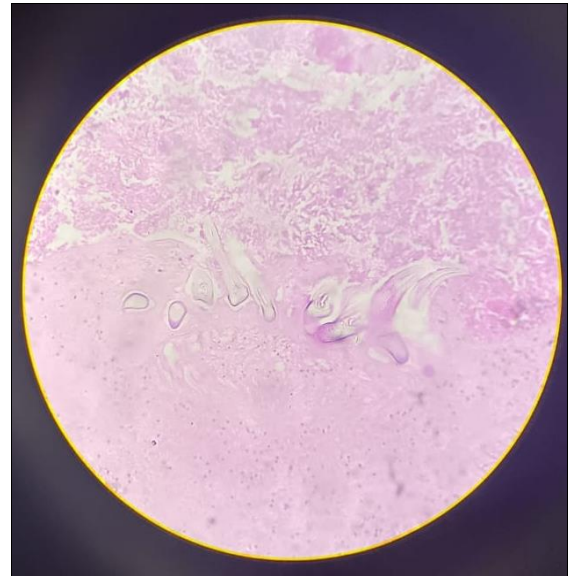


Fig 5: H&E shows refractive hooklets with surrounding histiocytes.

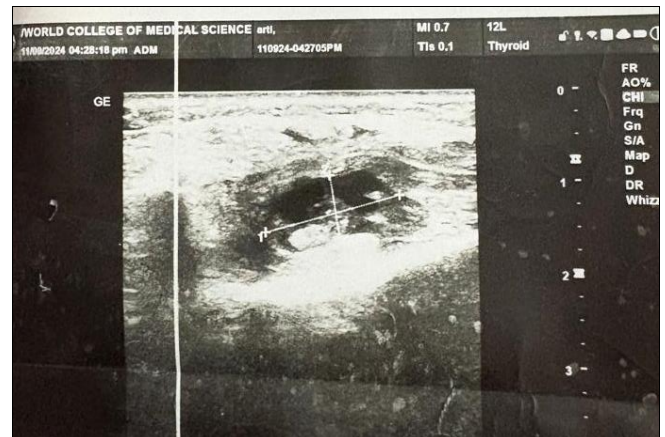


Fig 6: Ultrasonography showed a cystic lesion measuring 1.6x0.8cm within intermuscular plane showing internal echogenic content, anteromedial to left mandibular ramus likely involving Masseter muscle. ?Myocysticercosis with scolex

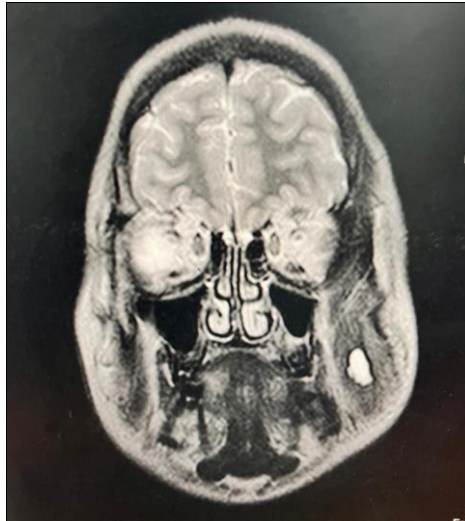


Fig 7: MRI Head and Neck: T2 hyperdense intramuscular cystic lesion involving masseter muscle, oval shaped showing smooth margins and no obvious internal solid component? Myocysticercosis.

Table 1: Summary of all 3 cases

Cases	Age/sex Site and clinical presentation	Ultrasound findings	Microscopic findings
1	34 yrs/ Male Painful Swelling in Left Arm (Biceps)	A well-defined ovoid tender cystic lesion with thin walls seen in upper left arm muscles (biceps) measuring 3x2x2 cm? myocysticercosis. A tiny 4mm central mural nodule/ calcification seen	Cysticercosis larva lined by palisading histiocytic aggregates and foreign body granuloma. Surrounding inflammatory infiltrate of lymphoplasmacytic cells with eosinophils and histiocytes
2	50yrs/ Male Painful swelling in Right Arm (Biceps)	Showed a well-defined ovoid tender cystic lesion with thin walls seen in upper right arm muscles (biceps) measuring 2.8 x 2.2 x 1.5 cm? Myocysticercosis.	Showed refractive hooklets with surrounding histiocytes with surrounding inflammatory infiltrate.
3	30 yrs/ Female Painful swelling in left side face (Masseter muscle)	Showed a cystic lesion measuring 1.6 x 0.8 cm within intermuscular plane showing internal echogenic content, anteromedial to left mandibular ramus likely involving Masseter muscle? Myocysticercosis with scolex.	Cysticercus with dense mixed inflammation.

Discussion

There are very few differential diagnosis for an acute swelling in arm associated with pain. Myositis is the most common diagnosis. Other conditions such as abscess, hematoma, granuloma, haemangioma, and lipoma cannot be ruled out. In our retrospective study, we were able to retrieve information regarding the occupational background of the patients and the disease affected both genders. The infective cysticercus gets lodged at various tissues and presents as cystic mass lesions with associated clinical manifestations depending on location.

In our cases, as the patient did not had any history of trauma or fever, it was difficult to make a definitive diagnosis clinically. Only after ultrasonography differential diagnosis of cysticercosis was made. Macroscopically, the cysts are uniform, round or oval vesicles measuring a few millimeters to 1-2 centimeter in size. When the cysts are viable, they have a translucent membrane, through which scolices can be visualized. However, when they start degenerating, the fluid in the cyst becomes more opaque and may undergo calcification [2]. Review of literature showed sporadic cases of cysticercosis of muscle reported and most of them managed medically. Solitary cyst involvement is common in India [5]; in our cases, since the patient had severe pain and difficulty in carrying day-to-day activities, it was decided to excise the mass. Skeletal muscle cysts are surgically removed only if painful [6]. Teniasis is associated with 25% of cases of cysticercosis. It should always be ruled out before the diagnosis of isolated cysticercosis is made [8]. Enzyme-linked immunoelectrotransfer blot for detecting specific antibodies is considered to be more specific diagnostic test [7]. Due to

unavailability of this test at our center, it could not be done.

This is a retrospective study between March 2024 to September 2024 and only those cases that have been excised are included. Most of the cysticercosis cases in clinical practice might not be excised due to various reasons. Hence, the number of cysticercosis cases reported in this study may not represent the actual burden of the disease.

Conclusion

In countries like India where people live in places where pigs are reared and sanitary conditions are poor, cysticercosis should be in differential diagnosis of intramuscular swellings. Medical management will cure the disease but if the patient is having severe pain and tenderness with difficulty in carrying daily activities, it is always recommended to excise the cyst. Surgery is one-time procedure with appropriate results. Cysticercosis carries good prognosis if diagnosed and treated on time. It is important to screen family members also if they are carriers and treat them as well. Always educate patient of good hygiene and to eat properly cooked meat.

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