Isolated Muscular Cysticercosis; a Diagnostic Challenge, a Case Report.

DR. SUBHASH POYEKAR
DR. DEEPALI AMBIKE
DR. AKSHAY WANKHEDE-PATIL

From Department Of Pediatrics, M.I.M.E.R Medical College, Talegaon (D),Pune.

Abstract

Cysticercosis is a parasitic tissue infection caused by dissemination of the larval form of the pork tapeworm Taenia solium. It is highly prevalent in the developing countries. It is endemic in areas of pork consumption, poor hygiene and low socio-economic conditions. Human cysticercosis occurs by ingestion of eggs from contaminated water and vegetables. The human then becomes an accidental intermediate host, with development of cysticerci within organs. Isolated muscular involvement is rare with only few cases have been reported in the literature. We report a case of isolated cysticercosis of the skeletal muscle that presented a diagnostic challenge. It was accurately diagnosed on ultrasound and Magnetic Resonance (MR) imaging, the patient's infection was managed with oral anthelminthic and symptomatic treatment without the need of operative intervention..

Keywords: Cysticercosis, tapeworm, albendazole, MRI

doi: 10.15713/ins.mmj.11

Introduction

Cysticercosis in humans is infection caused by the larval form of the pork tapeworm *T. solium* [1]. Central nervous system, the eye, striated muscle, subcutaneous tissue, and rarely, other tissues in order of frequency are affected with formation of cysts. In cases of muscular cysts; central nervous system is usually involved. Cysts are usually multiple [2]. Isolated muscular involvement is rare [3]. It presents a diagnostic dilemma for the clinician; as symptoms of this condition are non-specific. Only few cases of isolated muscular cysticercosis have been reported till date in the literature [2-13], with involvement of the biceps being even rarer [3,6].

We present a case of isolated cysticercosis of the biceps muscle, which presented a diagnostic challenge in resource constrained situation. It was accurately diagnosed on Ultrasound and Magnetic Resonance (MR) imaging and it was treated with oral anthelminthic medication and anti-inflammatory drug.

Case report

An otherwise healthy, 9-year-old, school going girl noticed swelling in the left upper arm which had increased over a period one month. On presentation to our institution, the patient had been suffering with discomfort in mid-upper arm. There were no aggravating or relieving factors.

There were no constitutional symptoms such as fever, night sweats, fatigue, weight loss or anorexia during this period. The patient's physical condition was good and her medical and family histories were insignificant. The patient was consuming mixed diet with consumption of eggs sometimes, but no history of pork or beef consumption. The patient denied any contact with animals or farms. None of the family member or person in neighbourhood had suffered similar illness.

On physical examination an obvious diffuse swelling of left mid-upper arm was noted; the overlying skin was stretched. Tenderness was localized to the medial aspect of the mid-upper left arm. Deep palpation revealed a soft to firm globular swelling 10 x 8 cm in size with indistinct margins. The mass was non-pulsatile and non-adherent to the skin. There was no change in the nature of swelling with movement of the shoulder or elbow joints. There was no local warmth or erythema. Range of motions of the elbow and shoulder joints were within normal limits and there was no evidence of distal neurovascular deficit.

Laboratory investigations were essentially normal with no evidence of anemia or leukocytosis or Eosinophilia. Liver Function Tests were normal.

Radiograph of the upper extremity (Figure 1) showed no obvious abnormalities.

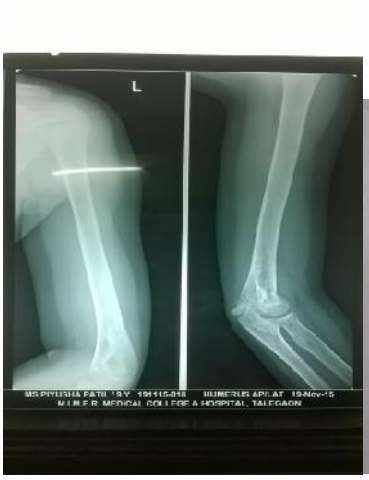


Figure -1

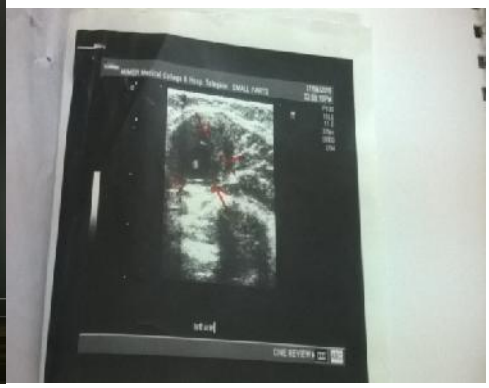


Figure -2

Figure -3

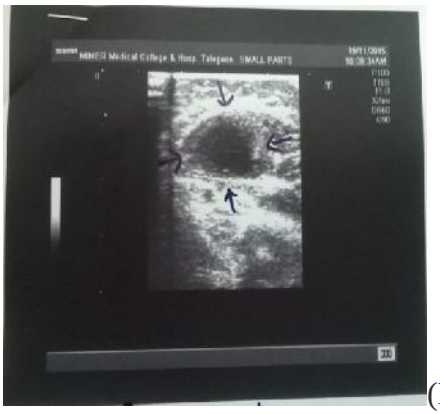
Ultrasound examination (Figure 2) reported a 7 x 7 cm. well defined cystic lesion in left Biceps muscle with eccentrically located echogenic focus(Calcification) noted in the swelling with changes suggestive of mild inflammation around the lesion.

MR imaging (Figure 3) was carried out; which revealed features of cysticercosis in the biceps brachii muscle.

CT scan of the brain and eyes did not show any evidence of cysticercosis.

The patient was managed on medical line of treatment in the form of oral anthelminthic drug (oral albendazole 15 mg/kg/day divided into two doses daily for 3 weeks) and symptomatic

treatment (Ibubrufen). The patient was followed up. Symptoms were relieved and at the end of four weeks there was some resolution of the swelling on palpation. No further symptoms were noted on follow up at the end of 2 months. Repeat Sonography showed decrease in size of lesion; with no evidence of inflammation (Figure 4).


(Figure 4)

Discussion

Cysticercosis is a parasitic disease caused by Taenia solium. This condition is endemic in countries such as India and African nations; It may be due to poor hygienic practices and pork is consumed as a food [1].

Human is the only definitive host of T. solium, harbouring adult tapeworm in intestine, whereas both man and Pig can act as intermediate host. Infection in humans is acquired through ingestion of eggs from contaminated water and vegetables[16] or consumption of raw or uncooked meat containing the cysticercus. Ingested eggs hatch in the small intestine, releasing oncospheres that penetrate the intestinal wall and enter the bloodstream to travel to various tissues where they develop to form an encysted larval form of *T. solium* known as cysticercosis cellulosae. Central nervous system is the most common site of infestation. Other tissues/organs infested are subcutaneous tissue, eye, muscle, liver and lung.

Early inflammatory reaction is not seen as living larvae are not recognized by immune system; but when the larvae die, they induce a vigorous granulomatous inflammatory response that may produce symptoms depending upon anatomic location.

Cysts formed in skeletal muscles usually do not show any symptoms. It may cause muscular psuedohypertrophy when parasite burden is heavy. The other common psuedotumors causing similar presentation such as lipomas, epidermoid cysts, neurofibromas should be considered as differential diagnosis[17,18].

During sonographic evaluation of cystic mass/swelling of muscles or subcutaneous tissues differential diagnosis of cysticercosis should be kept in mind if characteristics morphological features are encountered. Ultrasound can reliably diagnose muscular cysticercosis [2, 18]

Diagnostic criteria for human cysticercosis has been proposed by Del Brutto et al., (2008 [14]. They suggested that CT and MRI are important tools in diagnosis of cysticercosis; apart from immunochemical studies (including detection of anticysticercal antibodies),

Treatment of cysticercosis depends on the site of involvement. Asymptomatic isolated muscular or subcutaneous cysticercosis do not require any specific treatment unless it is painful, which may necessitate surgical intervention. As per case reports published recently; even for painful masses, surgical management is not required. Anthelminthic medication and oral steroid therapy has worked [6,13,15]. In our case, we instituted only oral anti-helminthic (albendazole) and symptomatic treatment. Patient has shown definite improvement.

To manage the inflammatory response steroids are commonly used. The success of our treatment strategy without oral steroid cover suggests that Non-steroidal anti-inflammatory drug may be sufficient as a cover to the inflammatory response in cases of isolated muscular cysticercosis. Non-steroidal anti-inflammatory drugs can be better treatment option to avoid the side effects of steroid therapy.

Conclusion

Isolated muscular cysticercosis possesses a diagnostic difficulty for treating physicians and it may present in a variety of forms. In cases presenting with any small muscle and/or soft tissue swelling a possibility of isolated muscular cysticercosis should always be considered. These cysts can be diagnosed with Ultrasound and MRI and can be treated with oral drug regimen of Albendazole and anti-inflammatory medications. Surgical intervention is not required in all the cases of isolated muscular cysticercosis.

Competing interests

The authors declare that they have no competing interests.

References

1. Garcia HH, Gonzalez AE, Evans CA and Gilman RH. **Taenia solium cysticercosis**. *Lancet.* 2003; **362**:547-56. | Article | PubMed Abstract | PubMed Full Text
2. Mittal A, Das D, Iyer N, Nagraj J, Gupta M, **Masseter Cysticercosis- a rare case diagnosed on Ultrasound**. Dento maxillary Radiology. 2008; 37: 113-16
3. Ogilvie CM, Kasten P, Rovinsky D, Workman KL and Johnston JO. **Cysticercosis of the triceps--an unusual pseudotumor: case report and review**. *Clin Orthop Relat Res.* 2001; 217-21. | PubMed
4. Abdelwahab IF, Klein MJ, Hermann G and Abdul-Quader M. **Solitary cysticercosis of the biceps brachii in a vegetarian: a rare and unusual pseudotumor**. *Skeletal Radiol.* 2003; **32**:424-8. | Article | PubMed
5. Kumar BD, Dave B and Meghana SM. **Cysticercosis of masseter**. *Indian J Dent Res.* 2011; **22**:617. | Article| PubMed

6. Kumar R, Singh V and Rastogi A. **Cysticercosis of temporalis muscle: a case report**. *J Pediatr Neurol*. 2005; **3**:269–72.
7. Nagaraj C, Singh S, Joshi A and Trikha V. **Cysticercosis of biceps brachii: a rare cause of posterior interosseous nerve syndrome**. *Joint Bone Spine*. 2008; **75**:219-21. | Article | PubMed
8. Sen K, Karmakar P, Bandyopadhyay A, Santra T and Sarkar M. **Cysticercosis involving muscles and liver only: A yet unknown entity**. *Ann Trop Med Public Heal*. 2013; **6**:350. | Article
9. Sethi PK, Sethi NK, Torgovnick J and Arsura E. **Cysticercosis of temporalis muscle: an unusual cause of temporal headaches. A case report**. *J Headache Pain*. 2007; **8**:315-6. | Article | PubMed Abstract |PubMed Full Text
10. Sharma R, Gautam P, Kumar S, Elhence P, Bansal R and Gupta G. **Isolated cysticercosis cellulosae of sternocleidomastoid muscle: a case report with review of literature**. *Indian J Otolaryngol Head Neck Surg*. 2011; **63**:127-30. | Article | PubMed Abstract | PubMed Full Text
11. Singal R, Mittal A, Gupta S, Gupta R, Sahu P and Gupta A. **Intramuscular cysticercosis diagnosed on ultrasonography in thigh: A rare case report**. *N Am J Med Sci*. 2010; **2**:162-4. | PubMed Abstract |PubMed Full Text
12. Yue XH. **Fine needle aspiration biopsy diagnosis of cysticercosis. A case report**. *Acta Cytol*. 1994;**38**:90-2. | PubMed
13. Singh S, Sreenivasan V, Garg K, Wazir ND, Rajput JS and Sandhu Virk P. **Cysticercosis involving muscle of mastication: a review and report of two cases**. *Case Rep Dent*. 2013; **2013**:814126. | Article | PubMed Abstract | PubMed Full Text
14. Del Brutto OH, Wadia NH, Dumas M, Cruz M, Tsang VC and Schantz PM. **Proposal of diagnostic criteria for human cysticercosis and neurocysticercosis**. *J Neurol Sci*. 1996; **142**:1-6. | Article | PubMed
15. Mohan K, Saroha V, Sharma A, Pandav S and Singh U. **Extraocular muscle cysticercosis: clinical presentations and outcome of treatment**. *J Pediatr Ophthalmol Strabismus*. 2005; **42**:28-33.
16. Horton J. **Biology of tapeworm disease**. *Lancet*. 1996; **348**:481. | Article | PubMed
17. Khan RA, Chana RS. **A rare cause of solitary abdominal wall lesion**. Iran J. Paediatr, 2008; **18** (3): 291-92.
18. Jankharia BG, Chavhan GB, Krishnan P, Jankharia B, **MRI and Ultrasound in solitary muscular and soft tissue cysticercosis**. Skeletal Radiol 2005;34:722-26

Copyright form

Manuscript Title:
Isolated Muscular Cysticercosis; a Diagnostic Challenge, a Case Report.

I/we certify that I/we have participated sufficiently in contributing to the intellectual content, concept and design of this work or the analysis and interpretation of the data (when applicable), as well as writing of the manuscript, to take public responsibility for it and have agreed to have my/our name listed as a contributor.

I/we believe that the manuscript represents valid work. Neither this manuscript nor one with substantially similar content under my/our authorship has been published or is being considered for publication elsewhere, except as described in the covering letter. I/we certify that all the data collected during the study is presented in this manuscript and no data from the study has been or will be published separately. I/we attest that, if requested by the editors, I/we will provide the data/information or will cooperate fully in obtaining and providing the data/information on which the manuscript is based, for examination by the editors or their assignees. Financial interests, direct or indirect, that exist or may be perceived to exist for individual contributors in connection with the content of this paper have been disclosed in the cover letter. Sources of outside support of the project are named in the covering letter.

I/We hereby transfer(s), assign(s), or otherwise convey(s) all copyright ownership, including any and all rights incidental thereto, exclusively to the Journal, in the event that such work is published by the Journal. The Journal shall own the work, including

1. copyright;
2. the right to grant permission to republish the article in whole or in part, with or without fee;
3. the right to produce preprints or reprints and translate into languages other than English for sale or free distribution; and
4. the right to republish the work in a collection of articles in any other mechanical or electronic format.

We give the rights to the corresponding author to make necessary changes as per the request of the journal, do the rest of the correspondence on our behalf and he/she will act as the guarantor for the manuscript on our behalf.

All persons who have made substantial contributions to the work reported in the manuscript, but who are not contributors, are named in the Acknowledgment and have given me/us their written permission to be named. If I/we do not include an Acknowledgment that means I/we have not received substantial contributions from non-contributors and no contributor has been omitted.

Name	Signature	Date
Dr. Subhash S. Poyekar	Poyekar	6.9.2016
Dr. Deepali A. Ambike	Ambike	6.9.2016

Manuscript Title

- Title of the article

  Isolated Muscular Cysticercosis; a Diagnostic Challenge, a Case Report.

- Category

  Case Report

- Names of all contributors.

1. Dr. Subhash Shankar Poyekar, M.D.(Ped.), Asst. Professor,

2. Dr. Deepali Abhijit Ambike, D.N.B.(Ped), Professor and HOD

3. Dr. Akshay Wankhade-Patil M.B.B.S., Resident,

Dept. of Pediatrics, MIMER Medical College, Talegaon Dabhade, Pune – 410 507.

SP and DA had equal contribution in writing this manuscript. All authors read and approved the final manuscript.

- Word count

  900 words

- Number of figures

  4

- Number of tables

  Nil

- Statement of conflict of interest

  Not stated

- Sources of support if any

  None

- Disclaimers if any

- Address for correspondence - the name, address, phone numbers and email address of the corresponding contributor

Dr. Subhash S. Poyekar, dr.subhashp18@gamil.com

Dr. Deepali A. Ambike ambikedeepa@gmail.com

Dept. of Pediatrics, MIMER Medical College,

Talegaon Dabhade, Pune – 410 507.

95 2114-308300

- Acknowledgment if any

Title page

1. Title of the article;
   Isolated Muscular Cysticercosis; a Diagnostic Challenge, a Case Report.

2. Names of all contributors;
   Dr. Subhash Shankar Poyekar, M.D.(Ped.), Asst. Professor,
   Dr. Deepali Abhijit Ambike, D.N.B.(Ped) Professor and HOD
   Dr. Akshay Wankhade-Patil M.B.B.S., Resident,
   Dept. of Pediatrics, MIMER Medical College, Talegaon Dabhade, Pune.

3. Word count;
   900 words.

4. Number of figures;

   4.

5. Number of tables;

   Nil.

6. Statement of conflict of interest;

   Not stated

7. Sources of support if any;

   None

8. Address for correspondence –

   Dr. Subhash S. Poyekar, dr.subhashp18@gamil.com

   Dr. Deepali A. Ambike ambikedeepa@gmail.com

   Dept. of Pediatrics,MIMER Medical College,

   Talegaon Dabhade, Pune – 410 507.

   95 2114-308300

9. Acknowledgment if any.