DOI: 10.7860/JCDR/2015/13474.6474

Original Article

Pathology Section

Spectrum of Typical and Atypical Clinico-Histopathological and Radiological Presentation of Soft Tissue and Muscular Cysticercosis in Mid-Western and Far-Western Region of Nepal

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ABSTRACT

Introduction: Soft tissue and muscular involvement in cysticercosis is a relatively rarer presentation.

Materials and Methods: Twenty seven histopathologically confirmed cases of soft tissue and muscular cysticercosis were collected and the clinical, radiological data was reviewed.

Results: There was female predominance for the lesions (19 cases among 27 cases). The most common location for the lesion was in the arm (9 cases), thigh (4 cases), forearm (7 cases), abdominal wall (4 cases) followed by nape of the neck (2 cases). Lesion ranged from 8 mm to 5 cm in size. Ultrasound was diagnostic in 24 cases and inconclusive in three cases. Histopathologically, intact cyst wall was noted in 12 cases, scolex in 5 cases. Seven cases showed degenerating cyst wall surrounded by inflammatory cells, granulation tissue and fibrosis.

Conclusion: Fine needle aspiration cytology and histopathological assessment is prudent in the diagnosis of soft tissue and muscular cysticercosis in cases posing clinical diagnostic dilemma.

Keywords: Cytology, Parasitic infection, Scolex, T. Solium

INTRODUCTION

Cysticercosis is the most common parasitic infection worldwide with a prevalence estimated at greater than 50 millions. The disease is endemic in Mexico, Central and South America and parts of Africa, Asia and India. Although considered endemic in various regions of the developing world, there has been an increase in the number of cases in the United States and Europe due to various factors including migration [1]. Cysticercosis is caused by ingestion of food, water, or faeces contaminated with eggs of T. Solium with humans as dead-end hosts. Autoinfection can occur from contaminated hands as well as regurgitation of proglottids of an adult tapeworm from the gut into the stomach. Larvae (oncospheres) released from their shells penetrate the gut mucosa and spread throughout the body developing into cysticerci. The clinical effects depend on the involved site, larval burden as well as the host response. Various organs can be affected due to cysticercosis including the brain, spinal cord, orbit, heart, subcutaneous tissues and muscles [2]. In this article, we discuss the various spectrum of typical and atypical clinico-histopathological and radiological presentation of soft tissue and muscular cysticercosis.

MATERIALS AND METHODS

A retrospective search was made in the records of the Department of Pathology for histopathologically confirmed cases of soft tissue and muscular cysticercosis between August 2011 and January 2015. Medical records of the cases were reviewed for their clinical, radiological data. A total of 27 cases of soft tissue and muscular cysticercosis were included in the study. Two cases with inadequate clinical/radiological information were excluded from the study. Fine needle aspiration was performed using a 22-g needle and 10 ml syringe. Smears were separately wet fixed and air dried and stained with conventional Papanicolaou and Giemsa stain respectively according to the amount of aspirate. Excisional biopsy specimens were collected in 10% Formalin for fixation, processed for 18 hours in tissue processor, paraffin embedded and blocks were prepared. Sections were stained by Hematoxylin and Eosin method and mounted using DPX.

RESULTS

Among the total of 27 cases, 19 cases were noted in females with eight cases in males. The age of presentation of patients ranged from 8 years to 65 years. The most common site of lesion was in the arm (9 cases), forearm (8 cases), the abdominal wall (4 cases) thigh (3 cases) followed by neck (3 cases). The size of the lesion ranged from 8 mm to 5 cm in diameter. The clinical presentation of the lesions varied depending on the site of the lesion. No any correlation was noted between the symptom and size of the lesion. Clinically, cysticercosis was misdiagnosed as lipoma in most cases (11 cases) [Table/Fig-1,2]. Ultrasonographically, 24 cases were suggestive of cysticercosis. Three cases were inconclusive for the diagnosis of cysticercosis.

Histopathologically, intact cyst wall was noted in 12 cases, scolex in 5 cases. Ten cases showed degenerating cyst wall surrounded by inflammatory cells, granulation tissue and fibrosis [Table/Fig-3-6].

On cytology, bladder wall of cysticercus were noted in majority cases (11 cases) followed by presence of hooklets in 6 cases in a background of mixed inflammatory cells [Table/Fig-2, 7].

DISCUSSION

Cysticercosis cellulosae, the larval stage of tapeworm Taenia solium is the causative agent of cysticercosis. Cysticercosis is endemic in many countries of the developing world posing a major public health problem [1]. Cysticercosis involves various organs of the body however involvement of the soft tissues and muscle is a relatively uncommon presentation [2]. The clinical presentation depends on the site of the lesion, larval burden as well as the host reaction. Subcutaneous cysticercosis presents as painless or painful subcutaneous nodules. Muscular cysticercosis has varied clinical presentation with frequently being asymptomatic to either of the described clinical manifestion: the myalgic, myopathic type; the nodular or masslike type; and the rare pseudohypertrophy type. In our series of cases, no any pseudohypertrophy type of presentation was noted which is relatively common in disseminated cases. In our study, the majority of the lesions were in the upper extremity which is similar to studies by Kala et al., and Handa et al., [3,4].

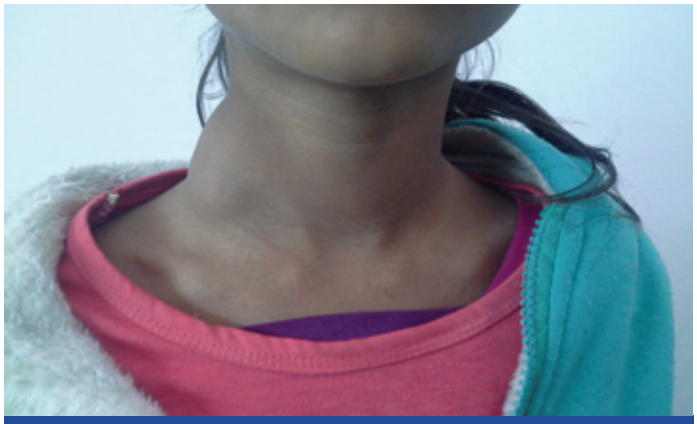
SN	Age (in years)	Sex	Site of the lesion	Clinical diagnosis	Ultrasound findings
1	12	F	Neck	Lymphadenopathy	Cyst with scolex and surrounding abscess
2	24	F	Forearm (Right)	Cysticercosis	Cyst with scolex
3	27	F	Abdominal wall	Lipoma	Cyst with scolex with perilesional edema
4	17	F	Forearm (Right)	Cysticercosis	Cyst without scolex but with perilesional edema
5	22	M	Arm (Left)	Lipoma	Cyst with scolex and surrounding abscess
6	19	F	Arm (Left)	Cysticercosis	Cyst with scolex with perilesional edema
7	23	M	Forearm (Left)	Lipoma	Cyst without scolex but with perilesional edema
8	27	F	Arm (Left)	Cysticercosis	Cyst with scolex with perilesional edema
9	8	F	Neck	Sebaceous cyst	Cyst with scolex with perilesional edema
10	37	F	Abdominal wall	Cysticercosis	Cyst without scolex with perilesional edema
11	41	M	Arm (Right)	Lipoma	Cyst with scolex with perilesional edema
12	65	F	Forearm (Right)	Lipoma	Cyst without scolex with perilesional edema
13	31	M	Neck (Right)	Cysticercosis	Cyst without scolex with perilesional edema
14	26	M	Arm (Right)	Cysticercosis	Cyst without scolex with perilesional edema
15	22	F	Thigh (Left)	Lipoma	Cyst with scolex and surrounding abscess
16	24	M	Arm (Right)	Cysticercosis	Cyst with scolex with perilesional edema
17	21	F	Abdominal wall	Lipoma	Inconclusive
18	20	M	Thigh (Left)	Lipoma	Cyst with scolex and surrounding abscess
19	18	F	Arm (Left)	Sebaceous cyst	Cyst with scolex with perilesional edema
20	21	F	Forearm (Right)	Neurofibroma	Inconclusive
21	20	F	Thigh (Left)	Lipoma	Cyst with scolex with perilesional edema
22	16	F	Arm (Right)	Cysticercosis	Cyst with scolex with perilesional edema
23	17	F	Forearm (Left)	Cysticercosis	Cyst without scolex with perilesional edema
24	57	F	Forearm (Right)	Lipoma	Cyst without scolex with perilesional edema
25	49	M	Abdominal wall	Lipoma	Cyst with scolex and surrounding abscess
26	42	F	Arm (Right)	Cysticercosis	Cyst without scolex with perilesional edema
27	37	F	Forearm (Right)	Neurofibroma	Inconclusive

[Table/Fig-1]: Clinical presentation of patient

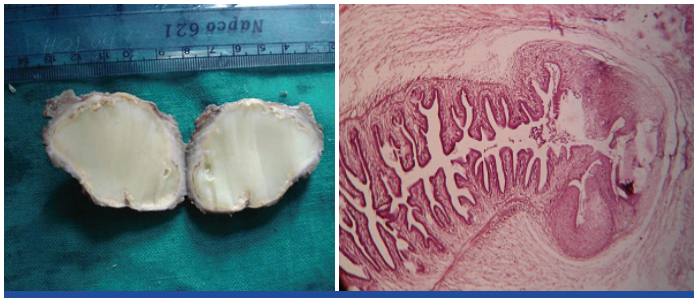
FNAC findings:		Histopathological findings:
Nature of Aspirate: Clear (7 cases) Blood mixed (8 cases) Purulent (12 cases)	Cytological findings: Bladder wall of cysticercus + mixed inflammatory cells (11 cases) Hooklets + minimal mixed inflammatory cells (6 cases) Foreign body giant cells + minimal mixed inflammatory cells (5 cases) Acellular cyst wall (5 cases)	Intact bladder wall (12 cases) Scolex (5 cases) Degenerating cyst wall with surrounding fibrosis, calcification, granulomas (10 cases)

[Table/Fig-2]: FNAC and Histopathological findings

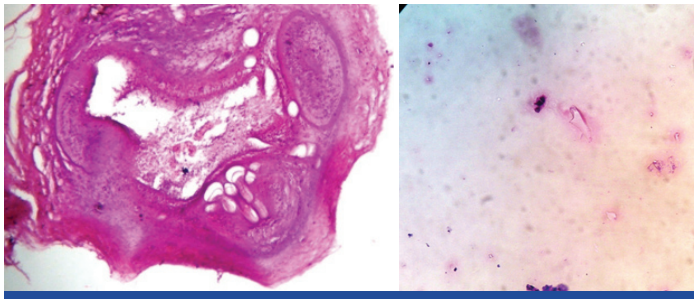
The prevalence of cysticercosis in Nepal has been shown to vary with gender, ethnicity, behavioral, environmental factor as well as geographical region [5]. There has been wide variation in the prevalence of Taenia in various studied population in Nepal with the highest 50% noted in the Magar community in Nepal [6].



[Table/Fig-3]: A 12-year-old girl with neck swelling who was clinically suspected as having lymphadenopathy



[Table/Fig-4]: Muscular cysticercosis showing a small cystic nodule at the periphery of the tissue. **[Table/Fig-5]:** Photomicrograph showing well defined host capsule surrounding a cyst containing a parasitic larva characterized by thick tegument with knobby projections (H&E X40)



[Table/Fig-6]: Photomicrograph showing scolex with suckers (H&E ×100)
[Table/Fig-7]: Photomicrograph demonstrating Scimitar shaped hooklet and a neutrophil in the center on cytology (Giemsa X40)

Imaging has been crucial in the diagnosis of soft tissue cysticercosis as well as muscular cysticercosis [7]. Among various imaging modalities, ultrasound is found to be widely performed due to its feasibility and characteristic features. The sonological spectrum of soft tissue cysticercosis includes intramuscular abscess with an eccentrically situated typical cyst with a scolex within, typical cysticercosis cyst with a scolex within and surrounding mild edema but no abscess as well as irregular cyst with no scolex within [7,8]. Imaging has been indispensable in the diagnosis of cysticercosis in atypical presentation where there is clinical diagnostic dilemma as in one of our patient who was diagnosed with suppurative lymphadenitis [Table/Fig-2].

Fine needle aspiration cytology is the preferred initial pathological examination in the evaluation of subcutaneous nodules which is usually performed image guided in atypical cases [9,10]. Various studies have demonstrated the implication of FNAC in diagnosis of cysticercosis in subcutaneous nodules. Although, the presence of eosinophils, neutrophils, palisading histiocytes and giant cells in the aspirate suggest a possibility of parasitic entity; the diagnosis of cysticercus requires demonstration of fragment of larval cuticle and parenchyma. In keeping with various studies, scolex was not present in the cytological smears [11]. In equivocal cases,

histopathological examination of biopsy specimen is fruitful in the diagnosis of cysticercosis. Definite diagnosis of cysticercosis can be made by demonstration of parts of parasite teguments, hooklets, parenchymatous portion and calcareous corpuscles.

CONCLUSION

It is important to have high degree of suspicion in patients hailing from or having history of travel to endemic regions for cysticercosis who present with any soft tissue or muscular cysticercosis. A clinico-pathological and radiological correlation is integral in such cases thus avoiding unnecessary intervention and patient morbidity.

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FINANCIAL OR OTHER COMPETING INTERESTS: None.

Date of Submission: **Feb 15, 2015**
Date of Peer Review: **May 27, 2015**
Date of Acceptance: **Jul 17, 2015**
Date of Publishing: **Sep 01, 2015**