Role of High Resolution Ultrasonography in the Diagnosis of Isolated Soft Tissue and Intramuscular Cysticercosis in a Tertiary Care Hospital.

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ABSTRACT

Background: Cysticercosis is one of the common disease seen in developing countries. In this disease, the extraneural tissues are usually involved synchronously or metachronously with the brain. Isolated infestation of soft tissue and muscle in the absence of neural involvement is more common than previously thought. High resolution ultrasonography has evolved now as an investigation of choice with proven sonological patterns of soft tissue cysticercosis which can entirely negate the need for invasive interventions. **Methods:** Prospective evaluation of total 8 cases of extraneural cysticercosis over a period of 4 months at Rama Medical College, Hospital & Research Centre, Hapur. HRUSG analysis of 8 cases was done to evaluate and classify the various classic sonomorphological features of isolated cysticercosis involving soft tissue and muscles. FNAC was done only in 3 cases. **Results:** Around 8 patients were selected on the basis of inclusion and exclusion criteria. Among 8 cases, 3 were male and 5 were female patients. Three individuals were vegetarian and five were non vegetarian. Mean age was 35 years. All cases were diagnosed on HRUSG. Intramuscular lesion was identified in 6 cases and 2 cases had subcutaneous involvement with anterior abdominal wall in the muscular plane as the commonest site in three patients. FNAC was done in 3 cases confirming the cysticercosis and was treated surgically. **Conclusion:** With the advent of high resolution ultrasonography and increased clinical awareness of the isolated soft tissue-intramuscular cysticercosis especially in endemic zone, a more conservative non-invasive approach can be applied both in diagnosis and treatment of these isolated cases of cysticercosis.

Keywords: Isolated cysticercosis, High resolution ultrasound, FNAC.

INTRODUCTION

Cysticercosis is the infection of human tissue with the larval form of the pork tapeworm, Taenia Solium is found to be endemic in Asia, Africa, Latin America and China.[1]

Unlike infestation with adult Taenia, cysticercosis does not require the patient to eat infected pork as the route of transmission is fecal-oral. This also raises the possibility of auto infection.

It is the most common parasitic infection of the central nervous system worldwide, but the involvement of other organ system, excluding the orbits, has been described only infrequently in the literature.[2]

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Isolated cases of intramuscular and subcutaneous cysticercosis are uncommon due to varied clinical presentations, however in these cases ultrasonography provides a means of definitive diagnosis and in recent years has emerged as the initial investigation of choice.[3] Non- invasive intervention with medical management has evolved as definitive line of management. Surgical interventions are indicated only in cases with larger associated abscess.

This was a maiden study in our set up and therefore this prospective study was planned and conducted to evaluate the diagnostic utility of HRUSG in isolated soft tissue- intramuscular cysticercosis.

MATERIALS AND METHODS

This prospective study was done over a period of 4 months, from October 2015 to January 2016 at Rama Medical College, Hospital & Research Cent re, Hapur Around 8 cases of isolated soft tissue and intramuscular cysticercosis were diagnosed on high resolution ultrasonography in department of Radio-Diagnosis in collaboration with department of Pathology,Rama Medical College, Hospital & Research Centre, Hapur.

Ultrasonography was performed and sonological features were evaluated in terms of:

- Site of the lesion: Soft tissue or Intramuscular
- Anatomical location
- Presence of cystic lesion with or withoutechogenic foci
- Presence of any collection/Abscess
- Signs of inflammations in the adjoining soft tissue and muscles

FNAC was done in 3 cases, two of them showed cyst without scolex and the third patients presenting with abscess/collection which was out of proportion to the primary cystic lesion. Three

cases requiring FNAC were treated with surgical excision.

Patients demographic profile especially the dietary habits and clinical diagnosis was also recorded.

Those patients with positive history of seizures and other concomitant medical issues were excluded from the study.

RESULTS

Out of the total 8 cases, there were 3 males and 5 female patients with a mean age of 35 years (range: 12-55 years). As far as dietary habits were concerned, three individuals were vegetarian, while five were non vegetarian food habit. All of the patients are from the predominate rural setup. Most of the lesion was found to be Intramuscular as was evident in 6 cases and 2 cases had only subcutaneous involvement.

The commonest site was an anterior abdominal wall in the muscular plane involving rectus abdominals in 3 patients. Patients' details and site of the lesion are depicted in [Table 1].

The most common USG morphology seen in 4 cases was that of a hypoechoic- anechoic cyst with an echogenic scolex with mild inflammation around it, without any abscess formation.

This was followed by irregular hypoechoic collection of exudative fluid within the muscles and subcutaneous tissue with cysticercal cyst containing echogenic scolex, seen in 3 cases. The least common feature was an irregular cyst with minimal fluid without any scolex in 1 patient [Table 2].

FNAC was done in 3 cases, two of them showed cyst without scolex and the third patient presenting with abscess/collection which was out of proportion to the primary cystic lesion.

FNAC showed inflammatory background with predominant eosinophils and histiocytes, consistent with cysticercosis.

The three cases undergoing FNAC were also diagnosed for cysticercosis on USG and underwent surgical excision. On follow up ultrasound study, no recurrence was noted in any of the cases.

Table 1: Patient Distribution.

Patient Distribution		No. of cases
Sex distribution	Male	3
	Female	5
Dietary Habits	Vegetarians	3
	Non- vegetarians	5
Location	Ant. Abd. wall (Rectus Abdominus)	3
	Triceps	2
	Biceps	2
	Brachialis	1

Table 2: HRUSG features in isolated soft tissue and intramuscular cysticercosis

Pattern of ultrasound imaging	No. of cases
Cysticercal cyst with echogenic scolex and mild inflammation (No Abscess)	4
Irregular cyst with minimal fluid. No scolex within the cyst	1
Irregular collection of exudative fluid within muscle with cysticercal cyst containing scolex	3

DISCUSSION

Cysticercosis was first described in the pig's way back by Aristophanes and Aristotle in 3rd century BC, latter it was noticed in human by Parunoli in 1550. Later in 1912, Krishnaswamy reported cysticerci related cases of muscle pain and subcutaneous nodules with abundant cysticerci in the muscles, heart, and brain at autopsy.

Cysticercosis has been known to be as a biological marker of the social and economic development of a community.[4]

As we know that, Cysticercosis is an infection with the larval form of pork tapeworm Taenia Solium is transmitted through fecal- oral route.[2] Humans normally act as definitive hosts. However man may become an intermediate host manifesting as the cysticercosis in one of the ways: i) by Hetro-infection, commonest through contaminated water, food (like vegetables); ii) by exogenous autoinfection due to ano- oral contamination in patient harboring the adult worm; iii) by endogenous autoinfection in which internal regurgitation of eggs occurs into the stomach due to reverse peristalsis from small intestine harboring a gravid worm.[5]

The occurrence of cysticercosis in human in order of frequency is central nervous system, eye, muscle, subcutaneous tissue, heart, pleura and peritoneum.[6] In this study, we have described isolated soft tissue and intramuscular cysticercosis.

The clinical presentation is usually non specific with varied differentials like lipoma, abscess, lymphadenitis, and neurofibroma. The symptoms of this disease usually depend on the locations of the cyst, the cyst burden and the host immune response.[7]

Muscular cysticercosis may present clinically with three distinct types: i) the Myalgic-myopathic type; where during the death of the larva there is leakage of fluid from the cyst resulting in acute inflammatory response; ii) the Nodular-mass like or pseudotumor; in which degeneration of cyst results in intermittent leakage of fluid eliciting a chronic inflammatory response with fluid collection around the cyst; iii) the rare Pseudo hypertrophic type; where multilocular cyst formation occurs in groups of muscle.[8]

The subcutaneous cysticercosis may present as painless or painful subcutaneous nodules.

With the above clinical presentations, it is necessary for clinicians to keep the differential diagnosis of soft tissue cysticercosis in patients with soft tissue nodules.

This study, which was based on ultrasonography highlighting again the importance of ultrasonography in making a definitive diagnosis of isolated disease, which usually present with a clinical diagnostic dilemma with varied differentials.

Ultrasonographic spectrum of isolated subcutaneous and intramuscular cysticercosis is already well described in literature.[9]

There can be four different sonographic appearances of muscular cysticercosis which are pathognomonic.[8,10] The first type is a cysticercal cyst with an echogenic scolex and an inflammatory mass around it. This mainly occurs due to death of the larva. The second type is an irregular cyst with very minimal fluid on one side, indicating fluid leakage. The eccentric echogenic protrusion from the wall caused by the scolex is not seen within the cyst, due to either escape of the scolex or partial collapse of the cyst. The third appearance is a large irregular collection of exudative fluid within the muscle with cysticercus cyst containing an eccentric scolex. This is due to chronic intermittent leakage of fluid from the cyst leading to florid inflammatory exudates. This is similar to an abscess; however, the absence of cysticercus cyst within the collection separates the two. The fourth appearance is that of a calcified cysticercosis, as multiple elliptical echogenic calcifications similar to millet seed calcification seen classically on plain radiograph.

The commonest ultrasound features in our study noted in 8 cases was that of a hypoechoic- anechoic cyst with an echogenic scolex with mild inflammation around it, without any abscess formation. These cases were of type one and occurs due to death of the larva.

The second common imaging finding was irregular hypo echoic collection of exudative fluid within the muscles and subcutaneous tissue with cysticercal cyst containing echogenic scolex, seen in 3 cases. These are due to leakage of the cystic fluid inciting inflammatory exudates.

The least common feature was an irregular cyst with minimal fluid without any scolexonly in 1 patient. The non- visualisation of scolex may be due to escape of scolex or due to collapse of cyst.

Naik D et al in 2011 reported 17 cases of isolated soft tissue cysticercosis diagnosed solely by USG with utilisation of medical approach to treat these cases. The most common ultrasound appearance was that of a cyst containing a scolex within and with surrounding abscess. They also concluded that HRUSG is reliable diagnostic modality for the diagnosis of soft tissue cysticercosis, which can be treated with drugs without much need of surgical intervention.[7]

Lohra S et al in 2014 also showed 7 consecutive cases of isolated soft tissue cysticercosis diagnosed on USG.[11]

Mittal A et al describe two cases of isolated cysticercosis one of them involving the pectoralis muscle which were clinically diagnosed as abscess but ultrasonography revealed a cyst with small echogenic scolex in it with surrounding hypoechoic area suggestive of cysticercosis.[9]

Sidhu R et al concluded that high resolution ultrasonography plays an important role in establishing the diagnosis of muscular cysticercosis, describing the classic morphologic characteristics.[3]

MRI is another diagnostic modality commonly used for the evaluation of soft tissue cysticercosis.The drawbacks with the MRI are mainly the availability and the cost effectiveness. MRI also required dedicated body coils to imaged specific localised anatomical sites. The presence of scolex is the commonest and specific diagnostic clue, which is more clearly appreciated on the ultrasound.

CONCLUSION

Although isolated myocysticercosis is uncommon manifestation of Taenia Soliuminfestation, it should always be considered as differential for soft tissue, muscular lesions especially in endemic zone. Noninvasive, non-ionizing advantages of ultrasonography play an important role in establishing the diagnosis of myocysticercosis with greater confidence curtailing the need for further investigation. The limitation of the study was duration of study was less, more such type of studies should be conducted with more duration of study.

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