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Case Report

The common and uncommon cestodal infestation encountered in routine histo - pathological practice from a semi-urban population in south India and their public health importance.

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ABSTRACT

Parasites are encountered uncommonly in routine histopathologic practice. Among them, cestodes form a major bulk. Cysticercosis heads the list forming the bulk of cases followed by Hydatidosis and Sparganosis. Microscopic identification of inflammation with surrounding reactions along with other morphological features forms the mainstay of diagnosis of parasitic diseases on histopathology. Identification of the parasites on histopathological examination would reduce the cost-diagnosis ratio avoiding expensive serological investigation.

1. Introduction

Generally parasitic lesions account for 0.1 to 0.5% of all histopathological lesions in our country. A majority of these are cestodal in nature. Tapeworms (cestodes) are segmented worms, the adult forms of which are encountered in gastrointestinal tract, whereas the larvae can be seen in almost any organ in the body.
The specimen most frequently submitted for detection of parasites is stool for the identification of ova or cysts. Specimens are obtained based on radiological investigations or are usually an incidental finding. The major advantages of histopathology are speed, low cost and presumptive identification. Hematological investigations like presence of eosinophilia in peripheral blood could give a clue about parasitic infestation [1,2].

Ours being a semi-urban hospital with many patients coming from rural areas, we receive specimens resected as a subcutaneous nodule, abscess, lymphadenopathy, gynaecomastia or labeled as soft tissue sarcoma ultimately yielding a cestode with tissue reaction. This article presents an overview of parasites encountered in our institution over the past two years.

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1.1.Case details

Sex	Age (in years)	Location	Histopathology
Female	20	Neck	Intact larva
Male	18	Neck	Degenerated larva
Male	22	Thigh	Degenerated larva
Male	68	Neck	Intact larva with
Male	15	(Submandibular)	secondaries (SCC)
Female	28	Chest wall	Intact larva
Male	15	Cervical	Intact larva
Female	8	lymphnode	Intact larva
		NeckChestwall	Intact larva

1.2. Discussion

Cysticercosis is the commonest cestodal infection encountered in histopathological practice and forms a major public health problem worldwide. It occurs due to ingestion of contaminated vegetables and food or under cooked meat. Auto-infection can also occur [2].

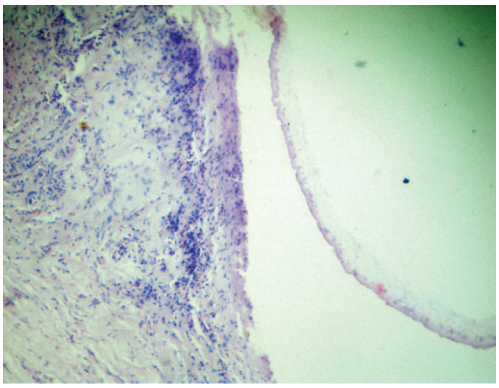
The life cycle of the cestode, T.solium involves an intermediate host, normally the pig, for the cystic form of the parasite and a definitive host, normally man, for the adult form or the tapeworm. However, persons infected by T.solium eggs can also serve as hosts for the cystic form, which affects various tissues of the body, most commonly central nervous system followed by sub-cutaneous tissue, muscle, eye and rarely other parts of the body [2,3].

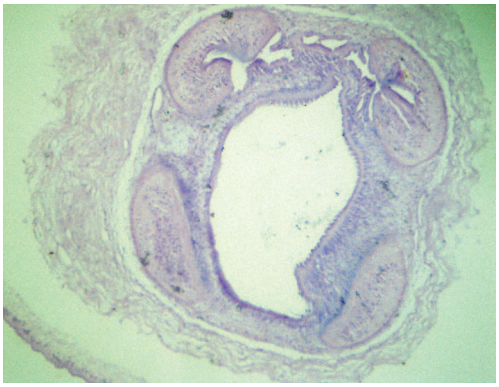
The diagnosis of human cysticercosis can be made by radiologic imaging, tissue biopsy, or serology. Radiologic imaging, including MRI and CT, currently is the most effective means for diagnosis [2,3].

Cysticercus forms the commonest parasitic infection of the CNS (Neurocysticercosis). In the CNS, they cannot grow into worms, and remain as cysts indefinitely. The cysts are usually found in Cerbral cortex, but can occur in meninges of the base of the brain, in the ventricles and rarely in the spinal cord. Compared to other sites, diagnosis in these cases is not feasible as routine biopsy is impossible. Diagnosis usually rests on interpretation of patients symptoms, radiological studies and immunological tests for dectection of anti-cysticercal antibodies (Enzyme-linked immunoelectrotransfer blot) [2-4].

Definite diagnosis on histopathology (Fig 1 A&B) requires visualization of the parasite. The live parasite has a single scolex with four suckers and a double row of hooklets. The cyst wall has an outer cuticular layer, a middle pseudo epithelial layer, and an inner reticular layer. In excision biopsies, only the cuticular layer of deadworm in appreciated on H&E stain[2].

Fig 1(A and B): Section of Cysticercosis showing inflammatory host response (A) H&E (10x). Section of cysticercosis (B) H&E (10x)





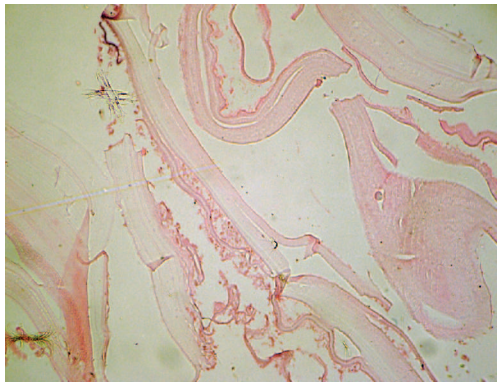
Rarely can it present in the form of subcutaneous nodules in the chest, thigh or arms. Histopathology would reveal a cysticerci larvae with surrounding host response composed of fibrosis, chronic inflammatory infiltrate with eosinophils and sometimes giant cells. Sometimes, cysticercosis can coexist with secondaries in lymphnode or Hodgkins of mixed cellularity type. Due attention should be paid to any co-existent disease lest, we miss them. As similar changes are encountered, it is critical for the histopathologist to differentiate between inflammatory conditions caused by infectious agents from those with non-infectious etiology [1,3,4].

Group II

2. Case details

A 37 year old farm laborer presented with history of cough and vague chest pain of few months duration. Chest radiograph revealed irregular masses in right middle zone with specks of calcification and fluid levels in a few of the cysts. Cyst was excised with lobectomy of the lung. The cystic mass measured 8x7x5 cm (Fig 2A). It was opalascent gray white in color. Cut section exuded about 50 ml of fluid and many daughter cysts with brood capsules. Microscopy revealed a lamellated membrane (Fig 2B) with many scolices diagnostic of Echinococcosis. Surrounding lung showed granulation tissue and bronchiectatic changes.

Fig 2 (A and B): Gross specimen showing resected lobe of lung with fragments of laminate membrane (A). Microscopy showing numerous folded delicate laminate membranes (B). H&E (10x)



2.1. Discussion

Echinococcosis is a zoonotic infection caused by tapeworms of the Taeniidae family. Human infection is often considered an occupational public health problem for the sheep (intermediate host) farmers, ranchers, or shepherds in endemic regions. There is however, a risk of infection from dog (definitive host) contact, dog feces, or food contaminated with eggs of E.granulosus.2,5

The most common site for hydatid cyst is liver followed by lung and others. The cyst wall shows contribution from both the cestode as well as the host and is composed of three layers. The outer host layer or pericyst is composed of fibroblasts, giant cells and eosinophils. The middle laminated membrane is a acellular chitinous layer 2 mm thick. The inner germinal layer is thin and translucent. Scolices originate from the membrane in the form of evaginations called brood capsules. Special stains like modified AFB stain for hooklets and GMS stain for chitinous cellular wall can be done. Alternately, the hooklets can be visualized as refractile structures against background debris. It is the commonest cestode pathogen affecting the lung.2,5,6

The eggs develop into embryos which penetrate intestinal mucosa and enters various organs via portal circulation. The larvae develop into fluid filled hydatid cysts. Daughter cysts may develop from germinal layer giving rise to brood capsules. Sometimes the cysts may get secondarily infected with suppuration. Mode of presentation depends on the organ involved and location of cyst.2

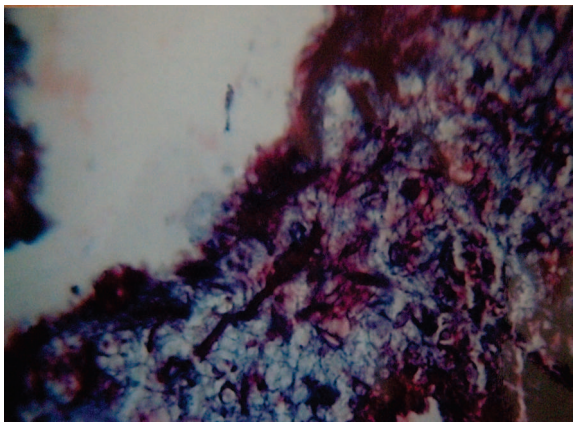
FNAC is contraindicated in a suspected case as the rupture of cyst could lead to serious anaphylactic shock. Diagnosis of hydatidosis in man is made by Casoni's test, by detecting protoscolices in hydatid cyst fluid or by detecting antibodies to cyst fluid antigen.[2,5,6]

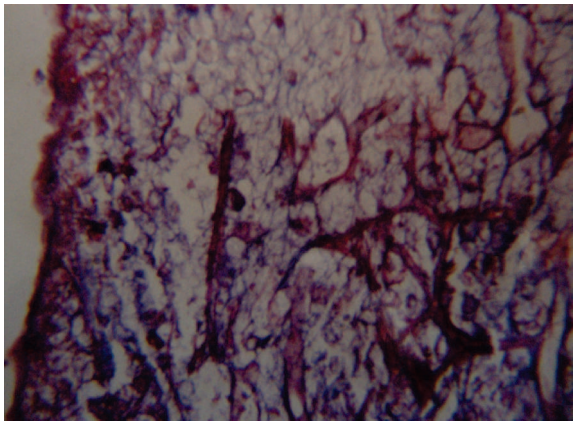
Group III

3. Case details

A middle aged man was diagnosed with unilateral gynaecomastia which was excised and sent for histopathology. The cystic mass was oval, greywhite in color ms 5x3 cm (Fig 3A). C/s revealed a worm 0.5cm long and 15 ml of turbid fluid. Microscopy revealed the worm having thick tegmentum with calcospheroites in sub-tegmentum (Fig 3 B&C) which was surrounded by wall of granulation tissue diagnostic of Sparganosis.

Fig 3 (A,B and C): Excised specimen showing cut open cyst (A). Section of Parasite showing Calcareous spherules and muscle fibres (B &C) – Masson Trichrome stain (40x).





3.1.Discussion

Sparganosis are the larvae of Diphyllobothrium species of genus, spirometra. The parasite has a complex life cycle with dogs and cats as definitive hosts. Humans are usually involved as second intermediate hosts. It is transmitted by consumption of snakes and frogs (II intermediate host). Transmission to humans usually occurs through ingestion of water contaminated with infected Cyclops (I intermediate host) or consumption of contaminated meat. Sometimes application of frogs as poultice over burns and wound also transmits the disease. Once a parasite enters the human body, an aberrant life cycle starts resulting in a cyst like structure.2,7

The histological features are similar in any tissue being characterized by a necrotizing and granulomatous inflammation with or without worm parasite in the lesions. The surrounding lesion is predominantly composed of eosinophils, plasma cells and lymphocytes. In the absence of worm, laminated calcospherules found in the cytoplasm of the proliferating macrophages and giant cells could be of diagnostic value.7

If the worm is viable, section of the worm would show dorsoventral flattening, thick, slightly wavy eosinophilic tegument overlaying a layer of radially oriented subparenchymal cells, well developed longitudinal bundle of smooth muscles consisted of dorsoventral and transverse fibres, arranged at right angle to each other.2,7

The microscopic differential diagnosis usually includes trichinosis, cysticercosis (racemose variant), and visceral larvae migrans.7

4. Conclusion

Parasitic infections are endemic in the rural and semi-urban communities in developing countries. Utility of histopathology in diagnosis is well established. Histopathological identification of the parasite based on its morphological features, host tissue response and in unconfirmed cases, coupled with serology and molecular diagnosis could help to successfully characterize the parasite. Effective communication between clinicians, radiologists and pathologists often lead to correct diagnosis in many difficult to diagnose diseases.

Public health measures such as good sanitation and personal hygiene measures such as washing of hands with soap and water. Washing of utensils and vegetable with clean water, prevention of sewage contamination of drinking water, safe disposal of waste, play a vital role in avoiding cestodal infections. Sanitary measures in abattoirs and treating pet dogs with Anti-helminthics also help. Even though this article does not actually represent the incidence of cestodal infections in a population, it should be emphasized that pathologists play an important role in identifying the parasite.

Information should be passed onto general public and patients in particular regarding the potential role of cestodes in incidence of malnutrition and morbidity in populations so that preventive steps are initiated and appropriate measures are taken given to prevent spread of the disease.

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