



“ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN DIAGNOSIS OF SUBCUTANEOUS CYSTICERCOSIS --- A REPORT OF 66 CASES”

¹ NISHA P MALIK -- ASSISTANT PROFESSOR, ²ASHUTOSH SINGH* -- SENIOR RESIDENT,
³ VEENA K SHARMA-- PROFESSOR AND ⁴ V .K SHARMA ---- PROFESSOR

¹ Department Of Pathology LLRM Medical College Meerut, U.P 250001 India

² Department of Transfusion Medicine, SGPGIMS, Lucknow, UP, India

³ Department Of Pathology LLRM Medical College Meerut, U.P 250001 India

⁴ Department Of Pathology LLRM Medical College Meerut, U.P 250001 India

ABSTRACT

Cysticercosis is caused by larval stage of tape worms *Taenia solium* (*T. solium*). Human beings get infected by eating undercooked pork or vegetables and drinking contaminated water infected with eggs of *T. solium*. Human cysticercosis commonly manifests as subcutaneous and intramuscular nodules. This study highlights the role of fine needle aspiration cytology (FNAC) in the diagnosis of subcutaneous cysticercosis. FNAC was performed using 23/21 gauge needle and 20 ml disposable plastic syringe fitted to a specially designed holder. Total, 66 cases were diagnosed to have cysticercosis, some rare sites were also aspirated like midline neck swelling & breast. In 48 cases (72.72%) actual parasitic structures, like fragment of the wall or tegument of parasite were demonstrated. In rest of cases inflammatory cell and eosinophils were seen. if the FNAC is done by trained cytopathologist with thin needle and with precautions, then it is quite safe and cost effective method, thereby eliminating the need of histopathological examination.

KEY WORDS: Cysticercus cellulose , parasitic lesions, FNAC.



ASHUTOSH SINGH

Department of Transfusion Medicine, SGPGIMS, Lucknow, UP, India

*Corresponding author

INTRODUCTION

Cysticercosis is a parasitic disease caused by the larvae of *Taenia solium*^[1]. Man is considered as the intermediate host of adult tape worm, *T. solium*. Human cysticercosis is more common than usually thought. It is a serious health problem and an economic burden in Asia. It is more common in the northern part of India. Human beings get infected by eating undercooked pork or vegetables and drinking contaminated water. Cysticerci can also develop in any organ, such as brain, eye, heart, or lung. The distribution of these cysticerci is usually in the subcutaneous tissue and muscles, causing palpable or visible nodules^[2]. Cysticercosis can be diagnosed by radiologic means, such as x-ray, CT scan & magnetic resonance imaging or by serology, both of which, however, are not definitive. The diagnosis is confirmed by biopsy and histologic examination of a subcutaneous nodule containing cysticerci. The aim of present study is to emphasize the importance of FNAC as quick, reliable method for definitive diagnosis of a subcutaneous lesion with parasitic etiology.

MATERIALS AND METHODS

Total 3000 aspirates of all subcutaneous swellings over a period of 10 years encountered in Pathology Deptt. Of L.L.R.M. Medical College Meerut, 66 cases were diagnosed to have *Taenia solium* infection. Among these 66 cases, majority presented as subcutaneous swelling (47) rest of them presented as lymphnode, breast swelling, midline neck swelling. FNAC was performed using 23/21 gauge needle and 20 ml disposable plastic syringe fitted to a specially designed syringe holder. The material obtained was smeared onto the glass slides. Air dried smears were stained with May Grunwald-Giemsa stain and wet fixed (95% alcohol) smears were stained by papanicolaou stain.

RESULTS

The study comprised of 66 patients in the age group of 2 to 65 years. Majority of patients

presented as subcutaneous/intramuscular nodule and cervical lymph node. The diameter of the nodule varied from 0.5 to 3 cm. They were soft to firm in consistency. Clinically it was thought to be either benign soft tissue tumour (lipoma), cyst, abscess, or reactive cervical lymphadenopathy. None of these cases suspected clinically as a parasitic cyst. Cysticercosis was also diagnosed on rare site like oral cavity, midline neck swelling presented as thyroglossal cyst, Breast as fibroadenoma (Table 1). The clinical diagnosis for cysticercosis of oral cavity and gall bladder were rudimentary thyroid and cystic neoplasia respectively. Ultrasound guided FNAC was done in case of gall bladder. Radiological findings are not available. These rare site cysticercosis were confirmed by histology. In majority of cases, the aspiration yielded clear fluid and in rest of the cases purulent fluid was aspirated. There was no complication after aspiration. In 48 cases on FNAC, actual parasitic structures like fragment or tegument of parasite were demonstrated in the smears Fig. 1 & 2. In 17 cases hooklets were seen. Ten cases revealed calcareous corpuscles. In the rest of cases i.e. 18 had no parasitic structures, but the cytological findings were very much suggestive of a parasitic cyst. These smears showed mixed inflammatory infiltrate comprising of eosinophils, polymorphs, lymphocytes, plasma cells, histiocytes and ill defined epithelioid cells, macrophages, Giant cells, ill formed epithelioid cell granuloma, proteinaceous background, and necrosis (Table -2). Above cytological findings suggested for parasitic cyst and advised for excision. Follow up biopsy confirmed the diagnosis of cysticercosis (Fig. 3).

DISCUSSION

Human cysticercosis is the larval infestation of the cestode *T. solium*. The distribution of these cysticerci is usually in the subcutaneous tissue and muscles, causing palpable or visible nodules but they can develop in any organ, such as brain, eye, heart or lung. Rarely other organ such as oral cavity, breast and gall

bladder may be involved. Saran et al.^[3], analyzing 120 cases, observed 4.2% in the mouth. Sahai et al.^[4] found only 16 cases of cysticercus in their breast aspirates. Fully developed cysticerci are opalescent, milky white cysts, elongated to oval and about 1 cm in diameter. The cyst contains fluid and a single invaginated scolex. The scolex has a rostellum, four suckers and 22-32 small hooklets. The cyst wall is multilayered, 100-200 µm thick and covered by microvilli. The outer, cuticular layer appears smooth and hyalinized and is frequently raised in projections^[5]. Beneath the tegument is a row of tegumental cells. The inner layer or parenchyma is loose and reticular, containing mesenchymal cells and calcareous corpuscles^[6]. The calcareous corpuscles are a unique feature of cestode tissue. These spherical, noncellular masses occur in the parenchyma and are especially prominent in larval cestodes. Cysticerci nodules in the CNS are easily diagnosed by CT or radiological features, However cysticerci nodules in the skin are difficult to differentiate from benign mesenchymal tumours and tubercular lymphadenitis on clinical grounds alone^[7]. FNAC has emerged as an easy, quick, reliable, and sensitive diagnostic tool in identifying parasitic cyst^[8,9]. In FNAC smears if we are able to demonstrate parasitic bladder wall, tegument fragments, hooklets and calcareous corpuseles, it helps to give definitive diagnosis and avoid open excision biopsy in many cases^[10]. The presence of scolex in cytology smear is an uncommon finding^[11,12]. No scolex was seen in any of our aspirate.

The subcutaneous aspirates which yield clear fluid should be especially looked for fragments of bladder wall in a clear acellular background. Fragment is usually seen as bluish fibrillary material with interspersed small nuclei corresponding to the parenchyma of the parasite. Tegument of the larva is thrown into rounded wavy folds with small round dark cells in the substance. Aspirate yielding purulent material may show fragments of bladder wall, including calcareous corpuscles, these are thick blue spherules giving honeycomb appearance and detached single hooklets^[13]. Cysticerci are usually well walled off from the surrounding tissue, and when the larva dies, it provokes an inflammatory response with eventual calcification or partial absorption of the parasite. The inflammatory reaction, as seen on histology, consist of palisading histiocytes, multinucleated giant cells, epithelioid cells, neutrophils, lymphocytes, plasma cells and eosinophils in varying numbers. Similar features were also seen in our smears where parasitic structures could not be demonstrated. One of our aspirates showed foreign body giant cells having engulfed bladder wall of parasite (Fig. 4). Aspirate of subcutaneous swelling showing inflammatory cells especially eosinophils should make one suspicious of a parasitic lesion, as this was an essential component in all cases showing inflammatory response in our cases. These cases should be followed by repeat aspirate or excision and histological examination. Therefore in all inflammatory / Cystic / inflammatory cystic lesion, the possibility of cysticercosis should be kept in mind.

Table 1
Clinical presentation in 66 cases included in the present study.

Site Involved	Incidence (No.)
Subcutaneous Swellings	47
Lymph Nodes	11
Muscle (Gluteal)	3
Rare Sites	-
Breast	2
Gall Bladder	1
Oral Cavity	1
Mid Line Neck Swellings	1
Total	66

Table 2
Cytological features in 66 cases included in present study.

Cytological Findings	No. of Cases
Fragments, body, wall of parasite	48
Inflammatory Cells (including Eosinophils)	32
Hooklets	17
Macrophages	15
Background : Proteinaceous	14
Calcareous corpuscles	10
Histiocytes	9
Giant Cells	10
Necrotic	7

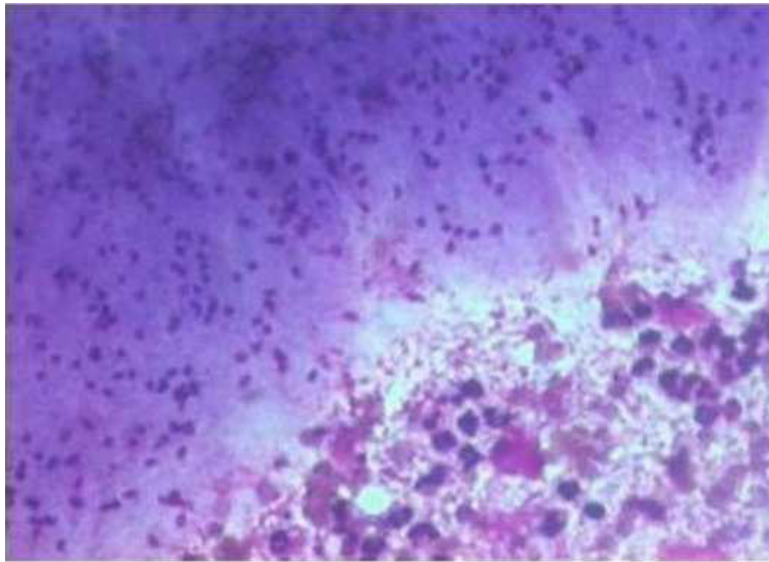


Figure 1
Wall of cysticercus with surrounding inflammatory cells (Giemsa, x400)

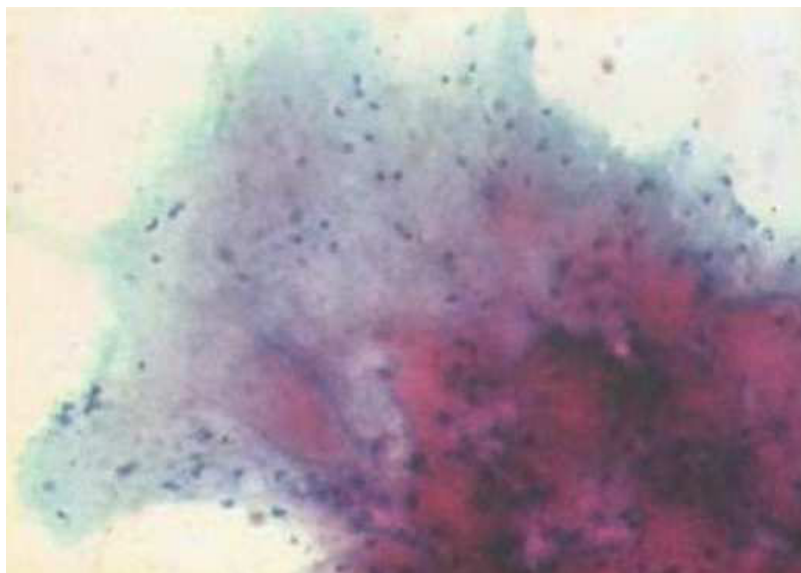


Figure 2
Photomicrograph showing wall of cysticercus cellulosae (Papanicolaou, x400)



Figure 3
Photomicrograph of tissue section showing cysticercus larva enclosed in a thin fibrous cyst wall (H and E, x100)

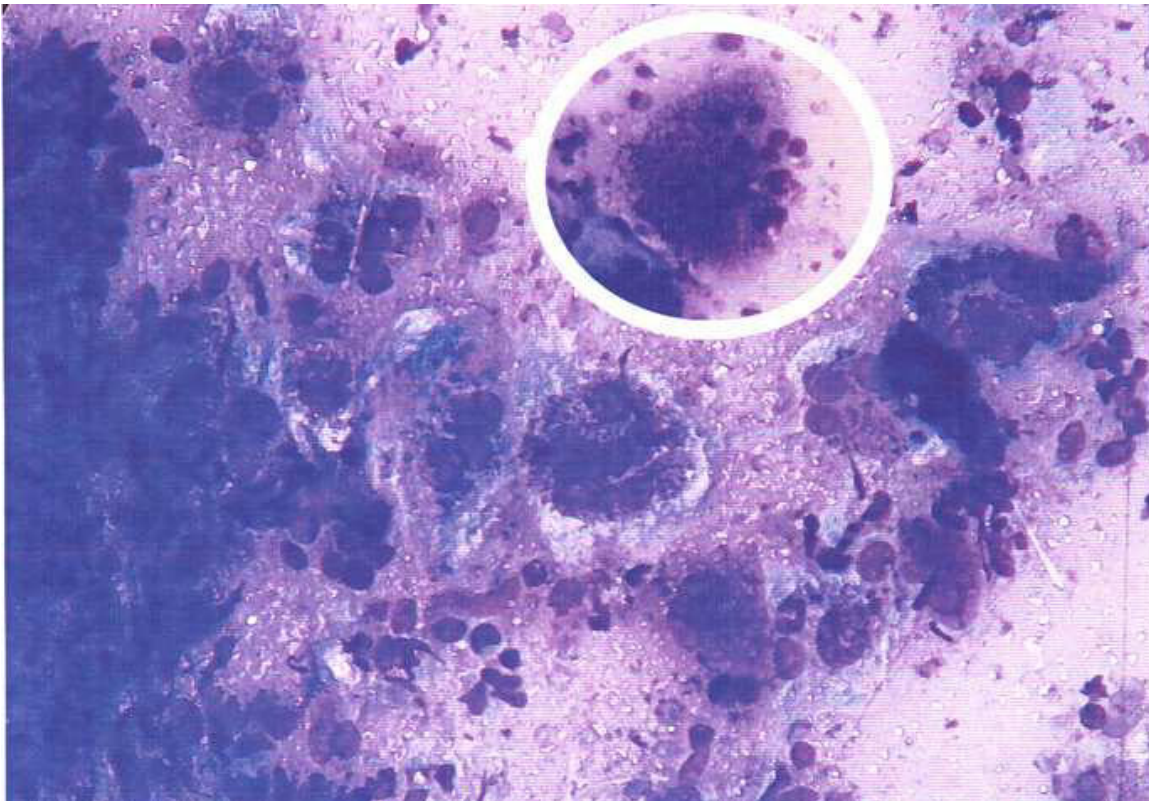


Figure 4
Photomicrograph showing foreign body giant cell reaction , Inset showing giant cell with engulfed bladder wall of parasite (Giemsa, x400)

CONCLUSION

There were no complications of aspiration in any of the cases. No local or systemic anaphylactic reaction was seen. We observed that if the aspiration is done by trained cytopathologist, with thin needle and with precautions then FNAC is quite safe method.

Thus cysticercosis presenting as palpable nodules can be diagnosed with considerable accuracy on FNAC, if parasitic fragments, bladder wall, hooklets or scolex or calcareous corpuscles are seen in aspirated smears, thereby eliminating an excisional biopsy.

REFERENCES

1. Manson – Bahr PEC, Apted FIC (eds). Manson's tropical disease, ed. 18. London : The English Language Book Society, 1982, pp. 242-3.
2. Chatterjee KD. Parasitology in relation to clinical medicine, ed. 12. Calcutta, India : Chatterjee Medical Publishers, 1980, P120.
3. Saran RK, Rattan V, Rajwanshi A, Nijkawan R, Gupta SK. Cysticercosis of the oral cavity: report of five cases and a review of literature. Int J Paediatr Dent 1998;8:273-8.
4. Sahai K, Kapila K, Verma K: Par a sites in fine needle breast aspirates assessment of host tissue response. Postgrad Med J 2002;78:165–7.
5. Vuong PN. Fine needle aspiration cytology of subcutaneous cysticercosis of the breast case report & pathogenic discussion. Acta Cytol 1989;33: 659-62.
6. Kamal MM, Grover SV. Cytomorphology of subcutaneous cysticercosis. A report of 10 cases. Acta cytol 1995;39:809-12.
7. Kung IT, Lee D, Yu HC. Soft tissue cysticercosis diagnosis by fine-needle aspiration. Am J Clin Pathol 1989; 92 : 834-5.
8. Verma K, Kapila K. Fine needle aspiration diagnosis of cysticercosis in soft tissue swelling. Acta cytol 1989;33:663-6.
9. Tayal V, Sharma VK, Agarwal AK, Bisht D, Sharma VK. Cysticercosis – A study of 38 cases of fine needle aspiration cytology. The antiseptic : 2003;100:356-7.
10. Rajwanshi A, Radhika S, Das A, Jayaram N, Banerjee CK. Fine-Needle Aspiration cytology in the diagnosis of cysticercosis presenting as palpable nodules : Diagnostic cytopathology, 1991;7:517-9.
11. Arora VK, Gupta K, Singh N, Bhatia A : Cytomorphologic panorama of cysticercosis of fine needle aspiration. a review of 298 cases. Acta Cytol 1994;38:377-80.
12. Gill M, Dua S, Gill PS, Gupta V, Gupta S, Sen R. Cytomorphological spectrum of subcutaneous and intramuscular cysticercosis : A study of 22 cases. Journal of Cytology 2010;27:123-6.
13. Handa U, Garg G, Mohan H. Fine needle aspiration in the diagnosis of subcutaneous cysticercosis. Dig. Cytopathol 2008;36:183-7.