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Fine Needle Aspiration Cytology of Cysticercosis: Report of three cases.

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ABSTRACT:

Background: Cysticercosis is a systemic parasitic disease caused by the larval stage of Taenia solium, the pork tapeworm. It is endemic in Southeast Asia, Latin America, and South Africa. In India, it is more common in the northern parts. The patient most commonly presents with subcutaneous and muscle involvement in the form of nodular lesions. The other most commonly involved sites include the eye, brain, bladder wall, and heart.

Case/Result: We reported the three case series, 1st case of 42 years-old male patients. The patient had single nodular right anterior chest wall swelling for 15 days without any other associated features. The patient was finally diagnosed with a case of cysticercosis with foreign body granuloma, which was diagnosed on FNAC. 2nd case in 38-year-old female patient. The patient had single nodular left cervical swelling for 1 month without any other associated features, the patient was finally diagnosed with a case of inflamed cystic lesion consistent with cysticercosis. 3rd case 23 years female patient presented with left flank swelling for 18 months with fever on & off for 6 months, the patient was diagnosed as a case with an inflammatory lesion consistent with cysticercosis.

Conclusion: Fine-needle aspiration cytology (FNAC) has emerged as a simple, minimally invasive, low-cost, outpatient diagnostic modality for the evaluation of nodules caused by parasites. Cysticercosis can be diagnosed on serology, and radiologically but confirmatory diagnosis is based on cytopathological and histopathological examination of the involved tissue FNAC and biopsy specimen.

I.INTRODUCTION:

Human cysticercosis commonly manifests as subcutaneous or intramuscular nodules, which may clinically be mistaken for commoner lesions such as lipoma, inclusion cysts, and lymphadenopathies. Since cysticercosis presents mostly as palpable swelling, the lesion is easily amenable for FNAC, which is a rapid and minimally invasive investigation to diagnose this condition [1]. Cysticercosis presents a wide spectrum of cytomorphological patterns ranging from viable cysts, cuticle fragments, scolex, and parenchyma to necrotic and calcified lesions. FNAC is a simple, sensitive, cost-effective, and rapid diagnostic tool for the evaluation of any superficial palpable lump or inflammatory nodule over various sites of the body including those caused by parasites [2].

II. METHOD & MATERIAL:

Report of three case series of cysticercosis, 1st case was a 42-year-old male with single nodular swelling over the right anterior chest, 2nd case in 38 years old female patient, and the patient had single nodular left cervical swelling, 3rd case 23 years female patient presented with left flank swelling were studied. Clinical details of all patients are given below. 22-gauge biopsy needles and the standard technique of aspiration were used to make the cytology smears. Smears were fixed with alcohol and stained with Papanicolaou stain; air-dried smears were stained with May-Grunwald-Giemsa stain.

III. CASE REPORT:

Case-1 42-year-old male presented with a swelling of the right anterior chest wall for 15 days. The swelling was tender 1 cm × 1 cm and soft to firm in consistency and fixed with underlying soft tissue [Figure-1]. He was non-vegetarian and his socio-

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economic status was poor. Apart from the X-ray other relevant tests have not been done, X-ray depicts normal findings. The clinical differential diagnoses proposed were tuberculosis, acute inflammation, mesenchymal tumor, and metastatic neoplasm. FNAC was done using a 22-gauge needle and a 10 mL syringe. Aspiration yielded fluidy material with granular particles. The smears were air dried as well as wet fixed in alcohol and stained with Papanicolaou, May–Grunwald–Giemsa, and hematoxylin and eosin, respectively. Cytology smears examination showed dense inflammatory infiltrates comprising predominantly neutrophils, fragments of granulation tissue, foreign body giant cells, and foreign body granuloma. Also noted was a fragment of cysticercosis showing multiple nuclei in a fibrillary background [Figure-2].

Case-2: A 38-year-old female patient. The patient had single nodular left cervical swelling for 1 month without any other associated features, swelling was 1x1cm and soft, cystic in consistency. She was non-vegetarian and her socio-economic status was poor. The radiological investigation was not done. On aspiration fluidy aspirate with whitish flakes-like material. Cytological smears are showing the tegument layer of the parasite without hooklets surrounded by mixed inflammatory infiltrates predominantly neutrophils, lymphocytes and histiocytes, and occasional giant cells [Figure-3].

Case-3: A 23-year female patient presented with left flank swelling for 18 months with fever on & off for 6 months, swelling was soft to firm in consistency measuring approx. 2x2cm for 18 months, painful tender swelling associated with fever. She was vegetarian and her socio-economic status was poor. Ultrasonography showing soft tissue mass measuring 1.62x0.68x1.31cm seen on a left lateral abdominal wall just inferior to the rib cage. On aspiration blood, mixed fluidy aspirate was aspirated. Cytology smears are showing inflammatory infiltrates comprised of lymphocytes, neutrophils, histiocytes, Foreign body granuloma and giant cells, and occasional fragment of the parasite [Figure-4].

IV. RESULT:

The final diagnosis of cysticercosis was made by cytomorphological findings and the tegument layer of the parasite without hooklet showing multiple small blue nuclei on the fibrillary granular background. Few cases have been reported that were diagnosed on FNAC. The case series highlights, single, nodular swelling in the right anterior chest wall region followed by left cervical swelling and left flank swelling. Cyto-morphologically it was suggestive of cysticercosis.

V. DISCUSSION:

Cysticercosis is a major public health problem, especially in developing countries. In India previously it was underreported, the prevalence of cysticercosis in India ranges somewhere between 7–26% and the number of lesions at a site. The clinical manifestations depend on location. It appears to be more prevalent in various places like Bangalore, Vellore, Bihar, Uttar Pradesh, Pondicherry, and Chandigarh. Cysticercosis is an ancient disease, causative parasite is Taenia solium also called pork tapeworm. Neurocysticercosis was first reported in a coolie from madras, who died due to a seizure. In 1912, Krishnaswamy was the first to report cases of muscle pains and subcutaneous nodules with abundant cysticerci in muscle, heart, and brain through autopsy. Clinical spectra of the disease depend upon the localization of the cyst. Though it is discovered from any site of the body buy the common sites are the central nervous system, subcutaneous tissue, skeletal muscle, and eyes [3].

Cysticercosis is an infection of both humans and pigs with the larval stages of the parasitic cestode, Taenia solium. This infection is caused by the ingestion of eggs shed in the feces of a human tapeworm carrier. Pigs and humans become infected by ingesting eggs or gravid proglottids. Humans are infected either by ingestion of food contaminated with feces or by autoinfection. In the latter case, a human infected with adult T. solium can ingest eggs produced by that tapeworm, either through fecal contamination or, possibly, from proglottids carried into the stomach by reverse peristalsis. Once eggs are ingested, oncospheres hatch in the intestine, invade the intestinal wall and migrate to striated muscles, as well as the brain, liver, and other tissues, where they develop into cysticerci [4].

Cysticercosis cellulose is more common than usually thought. In endemic areas, cysticercosis cellulose should be included in the differential diagnosis of nodular lesions including echinococcus, granulomatous lesions, and soft tissue swelling. Various diagnostic modalities employed to detect cysticercosis apart from FNAC include radiology, serology, and pathological examination [5].

The palpable parasitic nodules are often clinically misinterpreted as benign mesenchymal tumors such as lipoma, and calcareous corpuscles may be the only recognizable remnants in aspirates of calcified cysts. In the present case, the aspiration of clear

fluid and multiple nuclei in a blue fibrillary background with numerous inflammatory cells helped in arriving at a diagnosis of a parasitic cyst. A subcutaneous or intramuscular palpable parasitic nodule is most commonly due to cysticerci. Other parasites producing similar clinical presentation include coenuri, the larval form of tapeworm of the genus, and Multiceps and spargana, a larva of Spirometra mansonoides. Hydatid cysts caused by the larva of Echinococcus granulosus can also occur in the subcutaneous tissue as an unusual presentation. The aspiration of clear fluid is a strong indicator of parasitic infection in a palpable subcutaneous or intramuscular nodule [6].

FNAC in cysticercosis is a low-cost outpatient procedure. It is one of the tools for preoperative diagnosis and may even obviate the need for an open biopsy. The aspiration of granular fluid is a strong indicator of a parasitic infection in a palpable subcutaneous or intramuscular nodule [7].

The cytological diagnosis is quite straightforward in cases where an actual parasite structure is identified in the smears. Initially, the inflammation is comprised of macrophages and lymphocytes followed by the appearance of palisaded histiocytes, eosinophils, and plasma cells. Subsequently, neutrophils surround and invade the parasite and lead to its degeneration However, in other cases, the presence of histiocytes which may be in palisaded clusters, a dirty, granular background, etc., are features that should alert the pathologist to this possibility. Epithelioid cell granulomas can also be present in the later stages. Foreign body giant cells are invariably present in the surrounding inflammatory zone [7]. In this case, cytological smears are showing a tegument layer of the parasite with multiple nuclei without hooklet and inflammatory infiltrates comprising predominantly neutrophils, foreign body granuloma, and foreign body granuloma.

Control measures include proper cleaning and cooking of vegetables, meat inspection, health education, and adequate sewage treatment and disposal. The drug of choice is albendazole 10–15 mg/ kg/day given twice daily with a fatty meal. Seven to 14 days may be sufficient for some patients, but a longer course (up to 28 days) is advisable at present. It can be repeated as necessary. It can be combined with corticosteroids for the control of inflammation [7].

VI. CONCLUSION:

Fine needle aspiration cytology is a cheap, reliable, less time-consuming outpatient procedure for early diagnosis of the parasitic lesion, thus preventing unnecessary intake of anti-microbial drugs (eg; tuberculosis) and untimely surgical procedure. Anterior chest wall involvement by cysticercosis is rare. Measures like proper cleaning and cooking of vegetables and meat, health education, and proper sewage treatment and disposal play an important role in the prevention and control of this infection. Early commencement of treatment with anti-helminthic agents may help in preventing surgical intervention.

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Nil.

CONFLICTS OF INTEREST:
There are no conflicts of interest.

CONSENT:
Informed consent was obtained.

ETHICAL APPROVAL:
It is not applicable.

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FIGURES:
Numbers of figures-4.

Figure 1: Swelling in right anterior chest wall measuring approx. 1x1 cm, (Case-1).

Figure 2: Cytology smears showing fragments (Tegument layer without hooklet) of parasite having numerous nuclei with inflammatory infiltrates. H& E x10 (Case-1).

Figure 3: Cytology smear showing tegument layer of parasite having numerous small blue nuclei in fibrillary background with inflammatory infiltrates H&E x20, (Case-2).

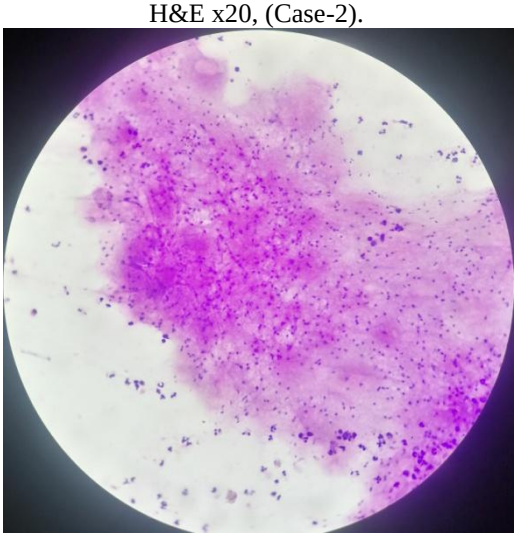

Figure 4: Cytology smear showing parasite with foreign body granuloma, giant cells and inflammatory infiltrates H&E x10 (Case-3).