ORIGINAL RESEARCH PAPER

Volume-8 | Issue-3 | March-2019 | PRINT ISSN No 2277 - 8179

INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

CYTOLOGIC DIAGNOSIS OF PARASITES PRESENTING AS CYSTIC LESIONS

Pathology

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ABSTRACT

Parasitic infections often present as superficial as well as visceral cysts. Fine needle aspiration cytology (FNAC) and Exfoliative cytology are very useful tool to visualise these parasites. Both conventional and liquid based cytology (LBC) techniques were performed on these aspirated samples for proper morphological visualisation. We had a total of 620 cases out of which 52 cases were diagnosed as parasitic origin. A confirmatory diagnosis could be made on all these 52 cases through conventional staining techniques such as May-Grunwald-Giemsa (MGG), haematoxylin and eosin (H&E) and pap stain; supported by special stains like periodic acid Schiff(PAS), methinamine silver stain in few selected cases. Confirmatory biopsy was available in 24 cases and therapeutic responses were followed up.

KEYWORDS

Cytology, Cystic lesions, Exfoliative, FNAC, Parasites,.

INTRODUCTION

Fine Needle Aspiration Cytology (FNAC)[1], and Exfoliative cytology[2] are very useful procedure for inflammatory cystic lesions caused by parasites. Parasitic infections presents as superficial and visceral cystic lesions. The cytological diagnosis is confirmatory when the parasites are visualised in the cytosmear. Conventional stains used for diagnosis are diff quick, H&E and pap. Special staining methods like PAS and methinamine silver stains support the diagnosis in some cases. LBC technique[3] is done in fluids for good morphological visualisation of the organisms.

In the study, we have detected parasites like Fialriasis[4-6], Amoebiasis[2,7], Giardiasis[8], Hydatid cyst [9], Cysticercosis[10-12], Schistosomiasis[13], Leishmaniasis[14] and Ascariasis[15]. The study also evaluated the clinical data, radiological findings, cytomorphological and histomorphological findings, intra operating findings and treatment responses. The findings of the study illustrates the usefulness of cytological study for diagnosis and early institution of therapy.

MATERIALS AND METHODS

This prospective study was conducted in department of pathology, SCB Medical College, Cuttack, Odisha between August 2015 to March 2018. The total numbers of cystic lesions were 620 out of which 52 cases were diagnosed as parasitic origin.

Superficial cystic lesions were presented to cytology OPD. FNAC of these cases were performed by using 22-23 gauze needles, dry and alcohol fixed smears were prepared for conventional staining procedure.

Samples of Visceral cystic lesions and Exfoliative cytology fluids were collected. Large volume fluids such as pleural fluid, peritoneal fluid, synovial fluid and urine ans Small volume fluids like intra operative fluids collected by the Surgeons, radiologically guided samples from liver, lungs etc., gastric lavage fluid were included in the study.

These samples were processed by conventional smear followed by liquid based cytology[03.] Commercially available LiquiprepTM TP(Thinprep) Kit (Cytyc Corporation, Marlborough, Massachusetts) was used. Smears were prepared by the basic steps of collection, concentration, and cellular encapsulation and adherence. Fluids were centrifuged and the supernatant were discarded in a standard centrifuge tube and to it 4 ml preservative solution and 4 ml of cleansing solution were added and kept for 1 hr period. Finally encapsulation and adherence was done using cellular base solution (alcohol and water).

All cases were followed up and patients responded well to the therapy due to early institution. However a total of three cases (3/52) died (Hydatid cyst-1, Neurocysticercosis-2) due to delayed clinical diagnosis.

RESULTS

During our study period we got 620 cases of cystic lesion, out of which 52 cases (both superficial and visceral cyst) were diagnosed cytologically as parasitic origin. The incidences of different parasitic lesions are mentioned in Table-1, with a predominance of microfilarial lesion (21/52), least being Schistosomiasis (01/52) and Leishmaniasis (01/52). Distribution of parasitic lesions is shown in Fig-1.

Table-1-Demography of Parasitic lesions in body.(n=52)

Sl. no	Cytological diagnosis	No of cases	Mean age	Sex
1	Filariasis	21	40.1	M-14 F-07
2	Amoebiasis	11	64.5	M-06 F-05
3	Giardiasis	05	36.6	M-04 F-01
4	Hydatid cyst	03	59.5	M-02 F-01
5	Cysticercosis	07	62	M-O3 F-04
6	Schistosomiasis	01	60	M-01 F-00
7	Leishmaniasis	01	30	M-01 F-00
8	Ascariasis	03	48	M-03 F-00

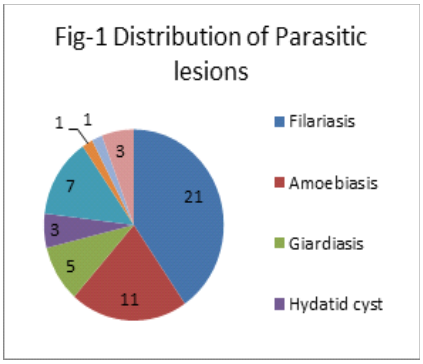

Table-2 depicts Clinical presentations and cytological findings of parasitic lesions The mean age of presentation of Filariasis being 40.1 yrs with range of (21 to 60 yrs), with male preponderance and the site of lesion is scrotal swelling (08/21) in majority [Table-2]. Amoebiasis (11/52) presented as liver abscess and colonic ulcer and was diagnosed from guided aspirated samples and lavage fluids (Fig-2 & 3). Giardiasis (05/52); and Ascariasis (03/52) were diagnosed from gastric lavage fluids who were presented with chief complain of abdomen. Three cases of Hydatid cyst noted in our study among them one died of late diagnosis and therapy. Cysticercosis (07/52) presented as brain tumour and other soft tissue swelling in the body with most frequent diagnosis being bladder wall cysticercosis. Two unusual cases one Schistosomiasis (Fig- 4 & 5) and the other Leishmaniasis (Fig-6 & 7) were diagnosed from multiple bladder cyst and swelling over arm respectively. Most of the cases responded to the treatment on follow-up with two cases (1-hydatid cyst and 1- neurocysticercosis) died due to delayed diagnosis and therapy.

Table-2:- **Clinical presentations and cytological findings of parasitic lesions.(n=52)**

Sl. no	Site of lesion	Clinical diagnosis	Age	Sex	Aspirate material	Cytological diagnosis
1	Scrotal swelling	Epididymal cyst	27	M	Clear fluid	Microfilaria
2	Swelling over right arm	? Inflammatory swelling	30	M	Blood mixed material	Leishmaniasis
3	Not mentioned	Pain abdomen , vomiting	35	F	Gastric lavage fluid	Giardiasis
4	Brain	Persistent Headache	55	F	Intra operative fluid	Cysticercosis
5	Bladder cyst	Pain in lower abdomen	60	M	Cyst fluid-guided aspiration	Schistosomiasis
6	Liver	Pain abdomen	43	F	Cystic fluid from liver	Hydatid cyst
7	Left leg swelling	Lymphatic cyst	60	F	Clear fluid	Filariasis
8	Swollen scrotum	Orchitis	32	M	Purulent	Microfilaria
9	Vomiting , bloating abdomen	? parasitic infestation	10	Mch	Gastric lavage	Ascariasis
10	Liver	Liver abscess	45	F	Guided aspiration-purulent	Amoebiasis
11	Inguinal lymph node swelling	Lymphadenitis	53	M	Blood mixed particulate material	Filariasis
12	Brain tumor	Brain tumor	51	M	Intra operative fluid	Hydatid cyst
13	Scrotal swelling	?Tubercular epididymitis	21	M	Purulent material	Filariasis
14	Stomach	? Parasitic ulcer	18	F	Gastric lavage	Amoebiasis
15		Pain abdomen, loose stool	60	M		Ascariasis
16	Stomach	Pain abdomen	11	Mch		Amoebiasis
17	Abdominal wall	Inflammatory swelling	25	M	Purulent	Hydatid cyst
18	Right arm	Soft tissue tumor	28	F	Clear fluid	Cysticercosis
19	Left breast swelling	Benign breast disease	37	F	Blood mixed material	Microfilaria
20	Left arm	Benign soft tissue tumor	32	M	Purulent	Bladder wall cysticercosis
21	Not mentioned	Pain abdomen , vomiting	30	M	Gastric lavage fluid	Giardiasis
22	Scrotal swelling	?Tubercular epididymitis	38	M	Purulent material	Filariasis
23	Left back	?Parasitic cyst	45	M	Clear fluid	Cysticercosis
24	Liver	Liver abscess	40	M	Guided aspiration-purulent	Amoebiasis
25	Right leg swelling	Lymphatic cyst	55	F	Clear fluid	Filariasis
26	Stomach	? Gastric ulcer	25	F	Gastric lavage	Amoebiasis
27	Right inguinal lymph node	Reactive lymphadenitis	36	M	Purulent material	Microfilaria
28	Right fore- arm swelling	Lymphatic cyst	47	F	Clear fluid	Filariasis
29	Swollen scrotum	Orchitis	35	M	Purulent	Microfilaria
30	Neck right side	Reactive lymphadenitis	36	M	Purulent material	Bladder wall cysticercosis
31	Left inguinal lymph node	Reactive lymphadenitis	30	M	Purulent material	Microfilaria
32	Fore- arm swelling left	Lymphatic cyst	41	F	Clear fluid	Filariasis
33	Scrotal swelling	Epididymo-Orchitis	38	M	Purulent	Microfilaria
34	Vomiting , bloating abdomen	? parasitic infestation	26	M	Gastric lavage	Ascariasis
35	Not mentioned	Pain abdomen , vomiting	30	F	Gastric lavage fluid	Giardiasis
36	Neck swelling	Inflammatory lesion	48	M	Purulent material	Microfilaria
37	Left foot swelling	Lymphatic cyst	45	M	Clear fluid	Filariasis
38	Not mentioned	Pain abdomen , vomiting	40	M	Gastric lavage fluid	Giardiasis
39	Back swelling	? Lipoma	25	F	Purulent	Bladder wall cysticercosis
40	Right breast swelling	Benign breast disease	29	F	Blood mixed material	Microfilaria
41	Liver	Liver abscess	31	F	Guided aspiration-purulent	Amoebiasis
42	Left inguinal lymph node	?Reactive lymphadenitis	55	M	Purulent material	Microfilaria
43	Colon	? Colonic mucosal ulcer	45	M	Colonic lavage	Amoebiasis
44	Not mentioned	Pain abdomen , vomiting	48	M	Gastric lavage fluid	Giardiasis
45	Liver	Liver abscess	52	M	Guided aspiration-purulent	Amoebiasis
46	Right fore- arm swelling	Lymphatic cyst	37	F	Clear fluid	Filariasis
47	Back swelling	? Lipoma	27	F	Purulent	Bladder wall cysticercosis
48	Colon	? Colonic ulcer	45	M	Colonoscopy fluid	Amoebiasis
49	Swollen scrotum	Orchitis	55	M	Purulent	Microfilaria
50	Stomach	? Gastric ulcer	36	M	Gastric lavage	Amoebiasis
51	Scrotal swelling	Epididymal cyst	24	M	Clear fluid	Microfilaria
52	Liver	Liver abscess	39	F	Guided aspiration-purulent	Amoebiasis

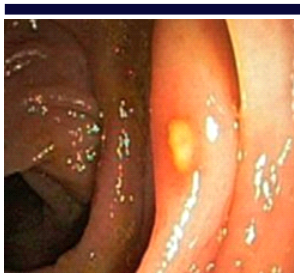

Fig-2: Pictomicrograph of Colonoscopy showing Ulcer in the colonic mucosa.

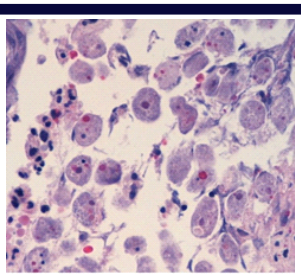

Fig-3: Pictomicrograph of Lavage sample showing Trophozoites of Entamoeba histolytica (H&E, x40)

Fig-4: Micrograph of urine cytology showing trophozoite of Schistosoma (Indian Ink Stain, x40)

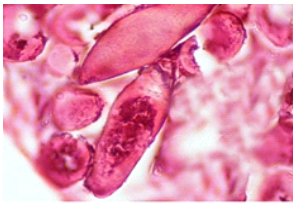

Fig-5: Micrograph of Schistosoma trophozoite in Histopathology section. (H&E, x40)

Fig-6: Photograph of 51 yr male treated case of Kalazar with multiple nodules in the body.

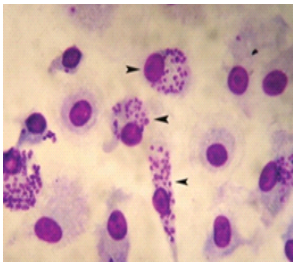

Fig-7: Micrograph of cytosmear showing LD bodies in histiocytes.(MGG Stain , x40)

DISCUSSION

A wide range of parasitic lesions can present as superficial and visceral cysts. Parasites can be morphologically diagnosed by FNAC[01] , exfoliative cytology[02] using LBC technique [03] and supported by special stains. Majority of parasitic lesions include Fialriasis in eastern Asia. The filarial illnesses are wide and varied however asymptomatic microfilaremia is the most common manifestation[12]. The classical presentations are lymphatic cyst, Orchitis, lymphadenitis and tropical eosinophilia. Less frequent sites of fialriasis being recurrent inflammatory lesions, breast nodule and sub cutaneous tissue[8]. Out of eight species of filarial worm that infect human only Wuchereria Bancrofti and Brugia Malyai are most commonly encountered in India[7] (Chowdhary et al. 2008). Many authors have reported microfilariae in breast lumps by FNAC[9-11]. Eight cases in our study presented with scrotal swelling showed microfilariae on aspiration. Two cases of breast swelling showed microfilariae and were clinically diagnosed as benign cystic disease.

Hydatid cyst is caused by a cestode Echinococcus; a most serious helminthic worm infestation to human being with worldwide distribution. It is found almost any part of the body with liver being the most common site (70%), followed by lung (15%) and only 10% cases occur in rest of the body[16-17]. The parasitic lesions like fialriasis, hydatid cyst and cysticercosis have been detected by FNAC [13,18-21]. The cysticercus infestation can be found in any organ with predilection for skeletal muscle, subcutaneous issue, eyes and central nervous system and is caused by larval form of Taenia Solium.Although not common, hydatid cyst may also occur in sub cutaneous tissue and can incite inflammatory response. It bears many similarities with cysticercosis but cytomorphological details help in distinguish both. Hydatid cyst have multiple daughter cyst within a parent cyst and hence yield many scolices , in contrast cysticercus have only one scolex. The bladder wall is thick, acellular lamellated in hydatid cyst[22] whereas in cysticercus it is thin and membranous.

Larval forms of Schistosomiasis can be demonstrated in urine samples[23]. Amastigoid forms of Leishmaniasis(LD bodies) are seen in FNAC samples of cutaneous lesion[24,25]. Visceral cysts are commonly seen in Gastro-intestinal tract and can be diagnosed by demonstrating trophozoites of Amoebiasis and Giardiasis in lavarge cystic fluid. Ascariasis can be directly visualised by endoscopy and cross-section of the worm can be visualised in lavarge sample[26].

The diagnosis of parasitic lesion by cytology is straightforward when actual structures of the parasite or parasite fragments are identified in the smears. However eosniophils, neutrophils and giant cells in the cytology smear clues towards parasitic lesions. Degeneration of parasites elicits inflammatory reaction and develops foreign body granuloma. The inflammatory cells in various compositions with granular dirty background and clear aspirate are the features which indicate the pathologist to suspect parasitic infestation. FNAC and Exfoliative cytology are two important early diagnostic tools which provides confirmatory diagnosis to parasitic lesions with ease and helps early institution of therapy for fully recovery of the patient. However histopathologic confirmation and special stains are essential on case to case basis. LBC techniques are very good advanced techniques which clearly establish the cytologic diagnosis with accuracy.

CONCLUSION

The diagnosis of parasitic lesion can be made from cytological preparation when proper morphological forms are demonstrated. An early diagnosis can help in management of such cases by institution of therapy.

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