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Research Article

Role of aspiration cytology in splenic lesions

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ABSTRACT

Background: Splenic fine needle aspiration cytology (FNAC) as a diagnostic procedure has been used since beginning of last century and was first reported in 1916. The objective of the study was to evaluate the diagnostic role of aspiration cytology in splenic lesions.
Methods: In our retrospective study Fine needle aspiration cytology (FNAC) of spleen was done in a total 34 cases, out of which 28 cases were aspirated under ultrasonological guidance and 6 cases were aspirated blindly. There were 23 male and 11 female patients and the age range of the patients was from 2 to 69 years with 8 patients from paediatric group. Before commencing the procedure all the necessary precautions and investigations including coagulation profile were done.
Results: Out of 34 FNAC cases, 5 were bloody aspirate while 2 cases showed normal splenic aspirate. In 27 cases definite diagnostic opinion was possible. Amongst non-neoplastic group maximum patients (8 cases) were showing features of extra medullary hematopoeisis followed by 4 cases of tuberculosis, then 3 cases each of kala azar and storage disorder and 2 cases showed granulomas. In the neoplastic group, we had 2 cases of non-Hodgkins lymphoma, one case of Hodgkin lympoma with 2 cases of hairy cell leukemia and one case of histiocytosis. No major difference in the cellularity noticed when the aspiration done blindly or under ultrasound guidance No procedural complications were seen in our study.
Conclusion: Hence when done with full precautions FNAC spleen is a safe, cheap, rapid and highly diagnostic procedure as a primary investigation.

Keywords: Spleen, FNAC, Ultrasonography, Tuberculosis, Lymphoma, Leishmaniasis

INTRODUCTION

The FNAC has become quite popular diagnostic modality now days. Splenic fine needle aspiration cytology (FNAC) as a diagnostic procedure has been used since beginning of last century and was first reported in 1916.[1] Although many authors from different centers have highlighted its utility for diagnosing splenic pathology, it is used routinely in very few cases. It has the reputation of being a dangerous intervention and the specimen obtained is usually thought to be unduly difficult to assess, but these prejudicial ideas are fundamentally wrong.[2-8] FNAC is a safe, easy, simple, reproducible and rapid diagnostic procedure and has distinct advantage over open true cut or core biopsy. As it requires no special instrument and incur no significant trauma and cost to the patient Although radiological modalities like ultrasound, CT scan, or MRI usually narrow down the differential diagnosis but rarely provide a definitive picture and tissue sample in form of an aspirate or a biopsy is required to clinch a specific diagnosis.[9-15] In these circumstances, FNAC remains the first mainstay diagnostic investigation. Splenic pathology can be localised or secondary to systemic involvement in various diseases. The indications of splenic FNAC[3-5,8,16] are non-

neoplastic diseases like infectious diseases, storage disorder, sarcoidosis, amyloidosis, hemophagocytic syndrome and neoplastic conditions like different haematological and metastatic epithelial tumours. In this present retrospective study, we have explored the role of FNAC in splenic lesion in a multidisciplinary tertiary health care centre.

METHODS

This retrospective study included 34 cases of splenic aspirations under ultrasound guidance (28 cases) and blind aspirate (6 cases). Detailed clinical profile, treatment history and other related pathological investigations were recorded. Patient consents were taken and coagulations profile was done in all the cases before doing FNAC. In all cases, the minimum cut-off limit for platelet was 50,000/mm^3 and the prothrombin time and Activated partial Thrombin time were in normal limit. The ultrasound guided FNACs were performed by the joint collaboration with radiologist using a 22 gauge spinal needle along with 20 ml syringe.[7] Blind splenic aspirate were done with 23 gauge needle without lapse of time in a quick stab like fashion, using non-aspiration technique and area was pressed for five to ten minutes. The aspirated material was used to prepare multiple air-dried and wet fixed smears. Both May-Grunwarld-Giemsa (MGG) and Papanicolauo stain were done routinely in every case. Special stains like Zeihel Neelson (ZN), and Periodic acid-schiffs (PAS) were used wherever required. The cytology slides were examined under microscope and diagnosis was correlated with other clinic pathological findings in these patients.

RESULTS

A total of 34 cases of splenic lesions were aspirated and out of which 23 were male and 11 were female (M: F-2.09:1) and 8 patients were from pediatric age group. The age range of the patients was from 2 to 69 years (Table 1).

Table 1: Age and sex distribution.

Age	No. of Cases	
	Male	Female
0-9	2	-
10-19	3	3
20-29	4	2
30-39	4	2
40-49	6	2
50-59	1	1
60-69	3	-
Total	23	11

Of these 34 cases, 5 samples (14.7%) had bloody aspirate, 2 cases (5.9%) did not show any specific pathology (normal/ reactive/no evidence of malignancy) and 27 cases (79.4%) showed specific pathology. The most common clinical presentation was pain in abdomen with splenomegaly (38%) followed by pyrexia of unknown origin. The distribution of splenic FNAC cases is highlighted in Table 2. In our study among non-neoplastic group maximum patients were from extra meduallary hematopoiesis that is 8 (23.5%) followed by 5 patients (14.7%) of tuberculosis (with the demonstration of acid fast bacilli) and 2 cases (5.9%) were reported as granulomatous inflammation. We reported 3 case (8.8%) of Kala azar and 3 (8.8%) cases of storage disease. In the neoplastic group, we encountered 2 cases of (5.9%) Non-Hodgkin's lymphomas, 1 case (2.9%) of Hodgkin's Lymphoma and 2 cases (5.9%) of Hairy cell Leukaemia and 1 case (2.9%) of Histocytosis (Table 2).

Table 2: Distribution of cases.

Diagnosis	No. of Cases	Percentage
Extra medullary Hematopoeisis	8	23.5
Tuberculosis	5	14.7
Kala azar	3	8.8
Storage disease	3	8.8
Granulomatous condition	2	5.9
No Hodgking's kymphoma	2	5.9
Hairycell leukemia	2	5.9
Hodgking's lymphoma	1	2.9
Histocytosis	1	2.9
Normal/ Reactive	2	5.9
Bloody aspirate	5	14.7
Total	34	100.00

Table 3: Comparision of USG guided FNAC with blind procedure.

USG guided FNAC				Blind Procedure			
Useful results		Bloody aspirates		Useful results		Bloody aspirates	
No. of cases	%	No. of cases	%	No. of cases	%	No. of cases	%
24	85.7	4	14.3	5	83.3	1	16.7

In our all cases of neoplastic pathology in splenic FNAC, we had primary diagnosis available either by histopathology or by FNAC of the primary lesions. All the lymphoma (2 non-Hodgkin lymphoma, 1 Hodgkin lymphoma) and Hairy cell leukaemia secondarily involved the spleen.

We did not found any case of metastatic carcinoma in our study.

DISCUSSION

For diagnosing splenic pathology, the tissue can be obtained by either by splenectomy specimen/core biopsy/FNAC. Splenectomy is avoided now a day, to

prevent OPSI (overwhelming post splenectomy infection) and core biopsy also not done routinely as danger of postop haemorrhage. FNAC is found to be a investigation of choice in multidisciplinary setting, with the team of pathologists, radiologist and clinician.[17-19] The spleen is a very vascular organ and rarity of splenic FNAC is due to the fear of complications like haemorrhage and rupture, which can be avoided when patient is cooperative and with emergency backup. In our study no procedural complications were seen while other studies have reported 0.5-1% complications.[7,20,21] Our maximum cases (23.5%) showed features of extra medullary haematopoeisis like scattered megakaryocytes, myeloid and erythroid cells along with polymorphous lymphoid cells. This occurs in setting of hemolytic anemia and in myeloid metaplasia and Austin et al and Zeppa et al in two separate studies reported the same.[22,23] (Figure 1)

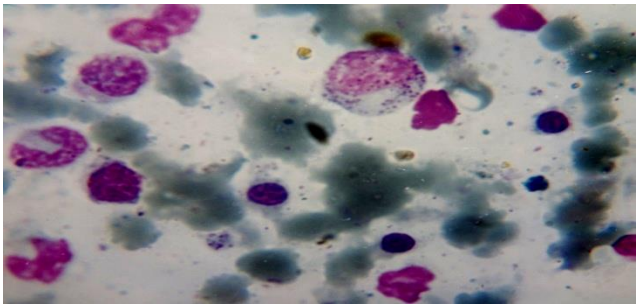

Figure 1: Splenic aspirate showing extramedullary hematopoeisis (Leishman x 700).

Amongst infectious causes we found 5 cases (14.7%) of tuberculosis with AFB demonstration in smears while in 2 (5.9%) cases just reported as granulomatous inflammation. In other studies incidence of splenic TB diagnosed by splenic FNAC was quiet high (Figure 2).[24,25]

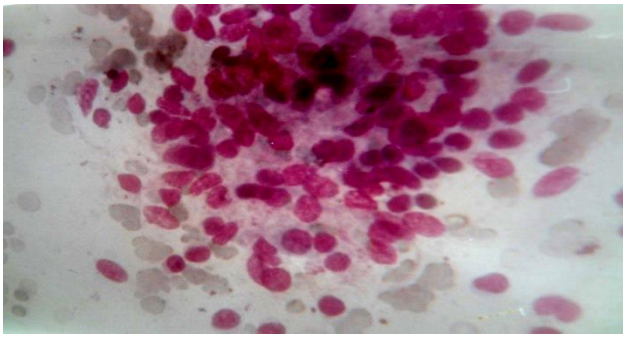

Figure 2: Granuloma formation in splenic tuberculosis (Leishman x 700).

We diagnosed 3 cases (8.8%) of Kala azar on splenic aspirates by demonstrating numerous safety pin like organisms in macrophages and outside. Our these cases presented with pyrexia of unknown origin with huge spleen and these findings are in accordance with the study by Thakur et al.[26,27]

We did not find any case of malarial spleen or other bacterial and fungal infection.[27] However the role of splenic FNAC in these infections is well documented.[28]

Amongst neoplastic group, we had primary diagnosis available. There were 2 cases (5.9%) of non hodgkins lymphoma. Both were of high grade. While in one case (2.9%) of hodgkins lymphoma, splenic aspirates showed scattered Reed Sternberg cells with polymorphous cell population. Splenic involvement help in staging of lymphoma. Also in some other studies similar findings were there (Figure 3).[29,30]

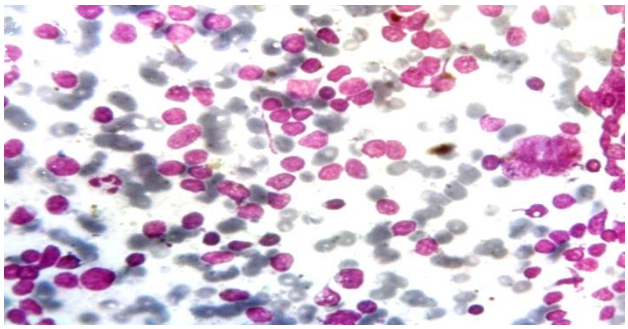

Figure 3: Splenic aspirate, showing infiltration by Hodgking's lymphoma (Lieshman x 280).

We also encountered 2 cases (5.9%) of hairy cell leukaemia. Hairy cell leukaemia is an uncommon but distinct lymphoproliferative disorder of B cell origin. It usually affects the spleen, bone marrow and uncommonly involve lymph node. There are only a few case reported where hairy cell leukaemia was diagnosed on FNAC spleen (Figure 4). [31,32]

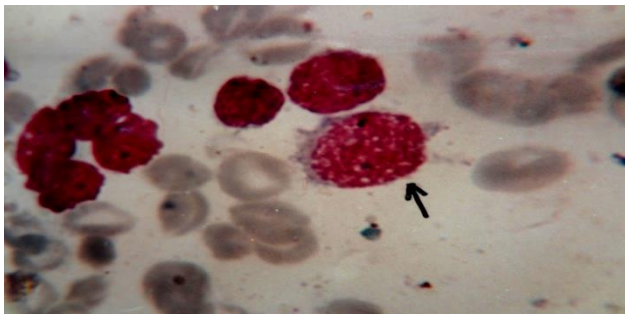

Figure 4: Hairy cell in splenic aspirate, in hairy cell leukemia (Leishman x 700).

In our study we encountered a child (2.9%), a case of histiocytosis involving cervical lymph nodes and splenomegaly. On aspiration from spleen we found similar langerhans type histiocytes, as were infiltrating the lymph nodes. Very few studies have been done on cytological study of histiocytosis involving the spleen (Figure 5).[33]

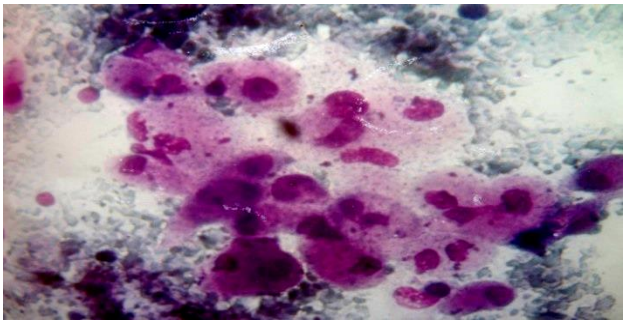

Figure 5: Splenic aspirate from the case of histiocytosis, showing foaming histiocytes (Leishman x 700).

We did not find any case of metastatic carcinoma, although spleen is not a rare site for carcinoma to metastasize. Gochhait D et al,[34] found 10 cases of metastatic carcinoma, out of total 54 cases of splenic aspirates while Kumar PV et al[16] reported 6 cases of metastatic CA.

In our study 3 cases (8.8%) of storage disorder, showed cellular splenic aspirates, having lipid containing macrophages with crumpled tissue paper cytoplasm and eccentric nucleus. Zeppa et al,[23] Kobayashi et al[35] and Mumtaz et al[27] also reported lipid storage disorder on splenic aspirates. (Figure 6)

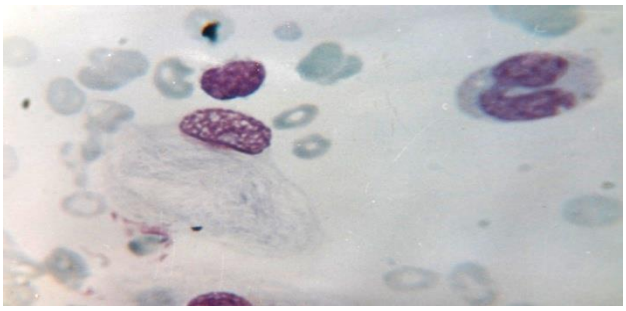

Figure 6: Splenic aspirate in storage disorder, showing macrophage having crumpled paper cytoplasm (Leishman x 700).

In our study, only 2 cases (5.9%) showed reactive picture. This means that there were no likely possibility of neoplastic lesion or storage disorder. However focal involvement of spleen, in metastatic malignancies may show reactive changes and mislead the actual diagnosis.[27]

In our study, out of 34 cases, 28 cases were aspirated under ultrasound guidance while 6 cases were aspirated blindly. No major difference in cellularity noted by aspiration or non-aspiration technique/ USG guided or blind procedure. However useful results were obtained in 24 (85.7%) cases, when the procedure was performed under USG guidance as compared to 5 cases (83.3%) if procedure was performed blindly (Table 3).

CONCLUSION

So we conclude, splenic FNAC is a rapid, cheap, highly diagnostic, reproducible and safe procedure, if performed under full precaution and avoid unnecessary need of splenectomy.

In the modem era of diagnostic world if combined with new ancillary techniques, it could be of great help in early and accurate diagnosis and treatment of the specific disease.

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REFERENCES

1. Arvandinos A. Modification dans la technique de la ponction de la rate. Bull Soc Pathol. 1916;9:444-8.
2. Block M, Jacobson LO. Splenic puncture. J Am Med Assoc. 1950;142:641-7.
3. Zeppa P, Vetrani A, Luciano L, Fulciniti F, Troncone G, Rotoli B, et al. Fine needle aspiration biopsy of the spleen. A useful procedure in the diagnosis of splenomegaly. Acta Cytol. 1994:38:299-309.
4. Friedlander MA, Wei XJ, lyendgar P, Moreira AL. Diagnostic pitfalls in fine needle aspiration biopsy of the spleen. Diagn Cytopathol. 2008;36(2):69-75.
5. Caraway N, Fanning CV. Use of fine needle aspiration biopsy in the evaluation of splenic lesions in a cancer center. Diagn Cytopathol. 1997;16:312-6.
6. Kang M, Kalra N, Gulati M, Lal A, Kochhar R, Rajwanshi A. Image guided percutaneous splenic interventions. Eur J Radiol. 2007;64:140-6.
7. Cavanna L, Lazzaro A, Vaillisa D, Civardi G. Artioli F. Role of image-guided fine needle aspiration biopsy in the management of patients with splenic metastasis. World J Surg Oncol. 2007; 5:13-8.
8. Venkataramu NK, Gupta S, Sood BP, Gulati M. Rajawanshi A, Gupta SK et al. Ultrasound guided fine neddle aspiration biopsy of splenic lesions. Br J Radiol. 1999;72(862):953-6.
9. Orell SR, Sterret GF, Walter MN, Whitaker D. Manual and atlas of fine needle aspiration cytology. New York, Churchil Livingstone, 1992.
10. Vlasov PV, Kotliarov PM. Radiation diagnosis of spleen diseases: radiation diagnosis of spleen diseases. Vestn Rentgenol Radiol. 1997;3:27-34.

11. Warshauer DM, Molina PL, Worawattanakul S. The spotted spleen: CT and clinical correlation in a tertiary care center. J Comput Assist Tomogr. 1998; 22(5):694-702.
12. Daskalogiannaki M, Prassopoulos P, Katrinakis G, Tritou I, Eliopoulos G, Gourtsoyiannis N. Splenic involvement in lymphomas. Evaluation on serial CT examinations. Acta Radiol. 2001;42(3):326-32.
13. Xie R, Zhou X, Chen J. CT in diagnosis of tuberculosis of liver and spleen. Zhonghua Jie He He Hu Xi Za Zhi. 1999;22(4):237-8.
14. Gabata T, Kadoya M, Mori A, Kobayashi S, Sanada J, Matsui O. MR imaging of focal splenic extramedullary hematopoiesis in polycythemia vera: case report. Abdom Imaging. 2000;25(5):514-6.
15. Calvo-Romero JM. Magnetic resonance imaging in primary lymphoma of the spleen. Arch lntern Med. 2000;160(11):1706-7.
16. Kumar PV, Monabati A, Raseki AR, Arshadi C, Malek-Hosseini SA, Talei AR et al. Splenic lessions. FNA findings in 48 cases. Cytopathology. 2007;18:151-6.
17. Haque AU, MIN KW, From P, Song J. Postsplenectomy Pneumococcemia in Adults. Arch Pathol Lab Med. 1980;104:258-60.
18. Haque AU, Aslam F. Postsplenectomy septicemia: a serious under recognized problem in Pakistan. JPIMS. 2002.
19. Chapman WC, Newman M. Disorders of spleen. In: GR Lee, Eds. Wintrobe's Clinical Haematology, 10th ed. Philadelphia, Lippincott Williams and Wilkins; 1998:1969-89.
20. Soderstrom N. Spleen. In: Soderstrom N, eds. J Zajicek's Monographs in Clinical Cytology: Aspiration Biospsy Cytology, Part II, Cytology of Infradiaphragmatic Organs Basel. Karger, 1974: 229-47.
21. Keogan MT, Freed KS, Paulson EK, Nelson RC, Dodd LG. Image guided biopsy of splenic lesion: update on safety and effectiveness. AJR Am J Roentgenol. 1999;172:933-7.
22. Austin GE, Giltman LI, Varma V, Thompson KN. Myeloid metaplasia presenting as a splenic mass: report a case with FNA cytology. Diag Cytopathol. 2000;23(5):359-61.
23. Zeppa P, Vetrani A, Luciano L, Fulciniti F. FNA biopsy of the spleen. A useful procedure in the diagnosis of splenomegaly. Acta Cytol. 1994;38(3): 299-309.
24. Rajwanshi A, Gupta D, Kapoor S, Kochhar R, Gupta S, Varma S, Gupta S. Fine needle aspiration biopsy of the spleen in pyrexia of unknown origin. Cytopathology. 1999;10(3):195-200.
25. Suri R, Gupta S, Gupta SK, Singh K, Suri S. Ultrasound guided fine needle aspiration cytology in abdominal tuberculosis. Br-J-Radiol. 1998;71(847): 723-7.
26. Thakur CP. A comparison of intercostal and abdominal routes of splenic aspiration and bone marrow aspiration in the diagnosis of visceral leishmaniasis. Trans R Soc Trop Med Hyg. 1997;91 (6):668-70.
27. Mumtaz A, Haque AU. FNAC on Spleenomegaly. Islamabad. 2003;23:3-5.
28. Lishner M, Lang R, Hamlet Y, Halph E, SteinerZ, Radnay J, Ravid M. Fine needle aspiration biopsy in patients with diffusely enlarged spleens. Acta Cytol. 1996;40(2):196-8.
29. Caraway NP, Fanning CV. Use of FNA biopsy in the evaluation of splenic lesions in a cancer center. Diag. Cytopathol. 1997;16(4):312-6.
30. Silverman JF, Geisinger KR, Raab SS, Stanley MW. Fine Needle Aspiration biopsy the spleen in the evaluation of neoplastic disorders. Acta Cytol. 1993;37(2):158-62.
31. Moriarty AT, Scwank GR Jr, Chua G. Splenic fine needle aspiration biospsy in the diagnosis of Lymphoreticular disease : a case report of 4 cases. Acta Cytol. 1993;37:191-6.
32. Pinto RG, Rocha PD, Vernekar JA. Fine needle aspiration of spleen in Hairy cell leukaemia. A case report Acta Cytol. 1995;39:777-80.
33. Yagita, Iwai M, Toguri M, Kimura H, Taniwaki M, Misawa S, Okarone T, Kashima K, Tsuchihashi Y. Hepatogastroenterology. 2001;48(38):581-4.
34. Gochhait D, Dey P, Rajwanshi A, Nijhawan R, Gupta N, Radhika S, Lal A. Role of fine needle aspiration cytology of spleen. APMIS. 2015;123(3): 190-3.
35. Kobayashi TK, Tamagaki T, Yoneyama C, Watanabe S, Sugihara H, Ida H. Imprint cytology of Gaucher's disease presenting as a splenic mass. A case report with molecular approaches. Acta Cytol. 1998;42(2):419-24.

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