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ROLE OF FINE NEEDLE ASPIRATION CYTOLOGY IN EVALUATION OF TESTICULAR AND PARATESTICULAR MASS LESIONS.

Pathology

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ABSTRACT

The study was done on 88 patients who had testicular and paratesticular lesions. Study included both retrospective and prospective analysis. Retrospective study was of 5 years duration which included 55 cases and prospective study was done for 1 year which included 33 cases. FNAC was carried out in all cases. Histopathological correlation was achieved in 16 cases. Cytological features were studied in all cases and compared with histology where results were available. Aspiration was performed with a 23-gauge needle on a 20-mL syringe.

Results : Out of 88 Cases included, 3 (3.4%) remained inconclusive, because smears were unsatisfactory. The remaining 85 cases were categorized as inflammatory lesions 44 (51.76%), noninflammatory lesions 7(8.2%), normal study 4(4.7%) and tumours 30(35%). Among the tumours, benign lesions were 20(23.5%) and malignant lesions were 10(11.7%).

Conclusion : FNAC is a rapid, easily available technique for evaluation of testicular and paratesticular lesions. It helps in making diagnosis and management plan. FNA of the testis and scrotum is a simple, quick, minimally invasive and painless outpatient procedure. The sample obtained is representative as several separate punctures can be made. There is no local scarring and undue surgery is avoided.

KEYWORDS

aspiration cytology, fine needle, testicular diseases, paratesticular diseases, male genital.

Fine Needle Aspiration is an extremely simple technique that has its origin in Sweden. It was first reported in early 1930 by Martin et,al and Stewart. Zajicek published his monograph on FNAC in 1974. This technique is increasingly being employed in the diagnosis of various testicular and paratesticular lesions because of its high diagnostic yield, rapidity and safety. This is a minimally invasive procedure. Smears are prepared from the aspirate, stained and examined under a microscope. The diagnosis can often be deduced in minutes to hours. Para testicular structures include retetestis, epididymis, mesothelium and paratesticular soft tissues along with testicular tunics and spermatic cord. These testicular and paratesticular structures are involved by various pathologies. 75% of paratesticular mass lesions derived from structures that surround the testicles within the scrotum are benign while 25% malignant in nature.

Materials and Materials

This study was conducted in the Cytology section of Post Graduate Department of Pathology Government Medical College, Jammu. Data collection included both retrospective and prospective analysis. For retrospective analysis a search was made in this regard with effect from November 1-2009 to October-31-2014 and the stained slides as well as the corresponding patient data was retrieved and reviewed. Prospective analysis included fresh cases of FNA for a period of one year w.e.f November-1-2014 to October-31-2015. Informed and written consent was obtained from the parents/ legal guardian in their native language. Detailed clinical history and relevant general physical examination, systemic and local examination was done on each patient. For superficially located lesions, direct FNAC was performed and for deep seated lesions, Ultrasound guided or CT guided FNAC was performed. The aspirate retrieved was expressed on to the slides so as to obtain 4-6 smears. The smears were then stained by May Grunwald Giemsa and Papanicolaou stain for microscopic examination.

Results

The present study included a total of 85 cases of testicular and paratesticular mass lesions. The 85 cases were categorized as inflammatory lesions 44 (51.76%); noninflammatory lesions 7(8.2%) normal study 4(4.7%) and tumours 30(35%).

Among the inflammatory lesions, 11(12.94%) had acute orchitis, 2(2.35%) cases had acute on chronic orchitis, 2(2.35%) had chronic orchitis. Orchitis is the most common lesion in this study. Smears showed few epithelial cells with acute inflammatory cells in acute orchitis, chronic inflammatory cells in chronic orchitis and mixed inflammatory cells in acute on chronic orchitis. 6(7%) cases had acute epididymitis, 3(3.52%) were of chronic epididymitis, 2(2.35%) had epididymoorchitis. Smears showed mainly acute inflammatory cells (acute epididymitis), chronic inflammatory cells (chronic epididymitis) along with epithelial cells. 3(3.52%) had scrotal tuberculosis, 8(9.4%) were of tubercular epididymitis, 3(3.52%) had tubercular epididymoorchitis and 4(4.7%) had tubercular orchitis. Smears in tubercular lesions were cellular with necrotic background, multiple epitheloid cell granulomas, multinucleated giant cells and lymphocytes.

Noninflammatory lesions were 7(8.2%) cases which included 1(1.17%) case of filariasis, aspirate of which yielded mostly clear fluid and smears showed the presence of slender microfilaria often coiled, with fragments of female gravid worms containing eggs. Eosinophils, neutrophils, epithelioid cells often adherent to microfilariae are seen. 1 (1.17%) case had atrophic testis, 3(3.52%) cases were of hydrocele, aspirate yielded clear fluid which on centrifugation showed mesothelial cells, lymphocytes and histiocytes. 2(2.35%) cases had spermatic granuloma epididymis. The smears showed mixed inflammatory cells consisting of lymphocytes, macrophages and occasional epithelioid cell granulomas. The background of the smear usually contains many spermatozoa and sperm heads. Macrophages with ingested sperm heads are frequently seen in the smears.

Out of the 20(23.5%) benign lesions, 3(3.52%) cases had adenomatoid tumour, the cytological features of which had moderate to abundant cellularity against a proteinaceous background. Cells were arranged in monolayered sheets with naked nuclei or in well defined multilayered clusters of small monotonus cells. Cells had abundant, poorly defined cytoplasm with paranuclear vacuoles, one small nucleolus and fine reticular chromatin and scant stromal fragments were also seen. 9(10.5%) cases had benign epididymal cyst. The cytomorphological features showed variable cellularity with proteinaceous background. Cells were scattered singly and was elongated in shape with scant cytoplasm, oval shaped nuclei with fine chromatin. 4(4.7%) cases had benign scrotal cyst .These are very common lesions seen in the scrotum. The cytomorphological features showed variable cellularity with proteinaceous background. Cells are scattered singly and are polygonal in shape with moderate amount of cytoplasm. 4(4.7%) cases had spermatocele. The cytomorphological features were variable cellularity with typically milky aspirate which imparts a proteinaceous background. Cellularity shows the presence of numerous immobile spermatozoids, balls of spermatozoids, histiocytes, spermiophages and some monolayered sheets of epididymal cells. FNAC is both therapeutic and diagnostic in Spermatocele

Out of the 10(11.7%) malignant lesions, 1(1.17%) case was of ALL relapse, Testes are one of the favourable sites of leukemic relapse. The cytomorphological features were cellular aspirates, composed of monomorphic, intermediate sized lymphoid cells. Cells appear blast

like with scant, basophilic cytoplasm, high N:C ratio and fine chromatin with small but prominent nucleoli. Absence of spermiogenesis, sparse sertoli cells, some with conspicuous cytoplasmic vacuoles were seen.

4(4.7%) cases had embryonal carcinoma which is a highly malignant tumour of primitive embryonal elements. The cytomorphology showed highly cellular smears with tumour cells arranged in clusters as well as scattered individually in haemorrhagic and necrotic background. Cells often show acinar formations. The individual tumour cells were large, show high degree of pleomorphism with abundant, pale and vacuolated cytoplasm, large, round to oval highly pleomorphic nuclei having vesicular chromatin and large prominent nucleoli. 1(1.17%) case of endodermal sinus tumour testis**.** Smears showed variable cellularity comprising of loosely cohesive epithelial like cells with mild to moderate pleomorphism, round nuclei and vacuolated cytoplasm. Papillary clusters of cells representing **Schiller Duval bodies** are a characteristic finding, when present. 3(3.52%) Cases had Classic seminoma , Seminomas are the most common type of germ cell tumour. Infants are almost never involved. The cytomorphological features showed cell rich smears with dispersed cells having little tendency to clustering and with little stroma. Cells were large with highly fragile cytoplasm and nuclei, with distinct nucleoli, fine chromatin with some clearing against tigroid background. Lymphocytes, plasma cells are also seen in the smears. Some epitheloid histiocytes, epitheloid granuloma, tumour giant cells are also seen in the smears. 1(1.17%) case of spermatocytic seminoma. Spermatocytic seminoma is a rare, slow growing germ cell tumour predominantly affecting men older than 65 years of age. The cytomorphological features were cellular smears with occasional edematous background .Cells were round showing pleomorphism having lymphocyte like, intermediate sized cells and mono or rarely multinucleated large cells. Some tumour cells display a filamentous or spireme chromatin pattern resembling spermatocytes. Frequent mitosis was also seen.

Discussion

The testis and paratesticular region is common site for a variety of inflammatory, benign and malignant lesions. The testis and paratesticular region is easily accessible site for fine needle aspiration. Lesions are easily and early identified due to easy accessibility and early onset of signs and symptoms like swelling and pain. FNAC is easy to perform and it helps to distinguish inflammatory and benign lesions from malignant lesions. Diagnosis on FNAC helps in instituting appropriate medical and surgical treatment.

In the present study, the age of patients ranged from 1.2 years to 70 years with a mean age of 39 years. Majority of the lesions (27%) in this study were in the age group of 41-50 years.

This finding is in concordance with the study published by **Paudyal et al. (2013)** who in their study evaluated the role of FNAC in 37 cases of genital lesions over a period of six years. The age of patients ranged from 2 to 80 years with a mean age of 39.3 year.

In the present study, there were a total 20 (23.5%) benign and 10 (11.76%) malignant tumours with a benign: malignant tumour ratio of 2:1.

Paudyal et al. (2013) in their study of 37 patients found benign lesions constituting (59.4%) of the cases and malignant lesions constituting (18.9%) of the cases. The ratio of benign: malignant in this study comes out to be 3:1.

In the present study, most common site of involvement was Testis (28%) followed by Epididymis (25.8%).

Results in our study are in concordance with the results of **Paudyal et al. (2013),** who in their study of 37 cases of genital lesions found the commonest site involved was testes (27%) followed by epididymis (21.7%)

In the present study, out of 85 cases there were 44 cases (51.76%) of inflammatory lesions. The two most common inflammatory lesions encountered in the present study were, lesions involving testis, most of which were Acute orchitis and the Tuberculous granulomatous inflammation which most commonly involved the Epididymis.

Our findings are in concordance with the results of study of **Verma AK et al. (1989)** who studied the role of FNAC in 403 patients of testicular and paratesticular mass and found inflammatory lesions in 104 (64%) cases.

Filariasis caused by nematode Wuchereria bancrofti occurs especially in tropics, India, and Nepal. It involves mostly epididymis and spermatic cord. In our study, out of 85 cases only 1 (1.1%) case of Filariasis was encountered.

Results of our study were in concordance with the studies conducted by **Gupta N et al. (2006)** who in a retrospective study of 228 cases of epididymal nodules evaluated the role of FNAC and found only 2 (0.9%) cases of Filariasis and **Handa et al. (2006)** who in a retrospective study evaluated the role of FNAC over a period of 5 years in 164 testicular and scrotal lesions and found only 3 (1.8%) cases of filariasis.

Spermatic granuloma is a granulomatous lesion that presents clinically as a nodular lesion in the region of the epididymis. Only 2 cases (2.3%) of Spermatic granuloma were encountered in our study.

Results of our study were in concordance with the study conducted by **Handa et al. (2006)** who in a retrospective study of 5 years in 164 testicular and scrotal lesions found 3 cases (1.8%) of Spermatic granuloma.

In our study, out of 85 cases, 18 (21.17%) cases of Tubercular lesions were encountered and was the commonest inflammatory lesion.

Viswaroop et al. (2007) in a study of FNAC in 40 cases of chronic epididymal lesion, found tuberculosis the commonest cause of chronic epididymitis which is in concordance with our study.

Shilpa et al. (2011) evaluated the role of FNAC in epididymal nodules. 40 lesions were aspirated and out of which, 14 (35%) cases were of Tuberculous granulomatous inflammation which were the most common lesions in this study.

The most common benign tumour in this study was Epididymal cysts 9(45%), followed by Scrotal cysts 4 (20%), Spermatocele 4 (20%) and Adenomatoid tumour 3(15%).

Adenomatoid tumour is the most common benign paratesticular tumour. Adenomatoid tumours are usually small nodules, typically occurring near the upper pole of the epididymis. They are well circumscribed. Microscopically they may be minimally invasive to the adjacent testis.

In our study only 3 (3.5%) Adenomatoid tumours were seen. Our findings were in concordance with **Shilpa et al. (2011)** who evaluated the role of FNAC in 40 cases of epididymal nodules and found, only 2 cases (5%) of Adenomatoid tumours.

Complications

Complications related to FNAC were not seen in any of the cases in the present study. There were no instances of iatrogenic, visceral or neurovascular injury or needle track seeding of the tumour in our study. There is a hypothetical risk of spread of malignancy by FNAC through the needle tract. However till now there is no such evidence **(Verma A K.(1989), Assi et al (2000)**. According to many surgeons the treatment of any testicular mass is orchidectomy, so FNAC of the testis is not very popular amongst surgeons. But now trend has changed as cytological studies have proved that FNAC is particularly helpful in diagnosis of swelling of testes that are suspicious for malignancy.

Summary

In the present study, FNAC proved to be a useful diagnostic modality for testicular and paratesticular mass lesions due to its high sensitivity and specificity in discriminating between inflammatory, benign and malignant lesions, high concordance rates with histopathological diagnosis, rapidity of diagnosis, ease of performance and no complications.

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