THE PATHOLOGIC SPECTRUM OF PARATESTICULAR ADNEXAL DISEASES: A TEN YEAR REVIEW OF SURGICAL BIOPSIES

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INTRODUCTION

While there have been several excellent studies on tumorous conditions of para-testicular adnexal structures, surprisingly little has been written regarding the overall disease spectrum of these organs. Neoplastic conditions are undoubtedly of importance and thus rightly have been the subject of a number of reports (1, 2, 3, 4). However, there are several other pathologic states that occur about this anatomical site which require analysis and documentation. It was for the purpose of a more meaningful and overall understanding of the diseased para-testicular adnexa that the present study was undertaken. This report concerns a 10 year analysis of all surgical specimens related to these structures received at the Singapore General Hospital, and an attempt is made to categorise the different lesions and correlate these wherever possible with clinical data.

MATERIAL AND METHOD

A total of 328 surgical specimens of para-testicular adnexal structures were received at the Singapore General Hospital between the period of 1968 and 1977. These cases were divided into 8 main pathologic types. An attempt is made to correlate the clinical symptomatology with the pathologic findings.

RESULTS AND DISCUSSION

Table I documents the main pathologic diagnosis of the 328 cases into the 8 main groups. Wherever necessary these groups are sub-typed and the clinico-pathologic correlation discussed below.

Cysts

The commonest lesion of extra-testicular adnexal structures encountered in this review was epididymal cysts. These constituted 75 (22.9%) of all the surgical biopsies. The cysts occurred with almost equal frequencies on both right and left sides, and sizes varied considerably from 1 cm. to the largest which measured approximately 8 cms. in diameter. They predominated in the younger age groups in the second and third decades where the largest size did not exceed 3 cms. in diameter. The bigger cysts were encountered in the older populations, and these were often multiloculated with thick fibrous walls in contrast to smaller thin walled unilocular cysts found in younger patients.

Table I. Pathologic diagnosis of 328 biopsy specimens of the paratesticular adnexa during the period of 1968 - 1977.

Surgical Biopsy Specimens of Paratesticular Adnexa (1968 - 1977)

Total Number of Cases - 328

Diagnosis	No. of Cases	Comment
Epididymal Cysts	75	? Congenital (59) Age. Decades 1-3 ? Acquired (16) Age. Decades 4-8
Sperm Granulomas	21	Peak incidence Decades 3-4
Acute epididymitis	41	Right sided lesions (29) Left sided lesions (12)
Chronic epididymitis	53	Right sided lesions (30) Left sided lesions (23)
Granulomatous Inflammation	69	Tuberculous (34) Filarial (22) Non-specific (13)
Congenital Malformations	7	Atresia of testis with epididymis (6) Others (1)
Varices	31	Number of cases probably non-representative
Tumours	31	Adenomatoid tumours (7) Leiomyomas (6) Lipomas (6) Other tumours (12) Malignant tumours (0)

Microscopically, these lesions were lined by a single layer of cuboidal or ciliated columnar type of epithelium enclosing empty spaces. The capsules were formed of fibrous tissue of varying thickness with or without interstitial haemorrhage, and sometimes associated with a chronic inflammatory infiltrate.

The correct pre-operative diagnosis of epididymal cysts was made in over 90% of cases. Diagnostic difficulties occurred mainly with long standing lesions when the presumptive pre-operative diagnosis ranged from chronic abscesses, tuberculous epididymitis and even testicular tumours. However, the diagnostic accuracy at operation was virtually 100%.

Epididymal cysts are probably of two types: one, a congenital defect, the other probably acquired. Congenital cysts which are smaller and found in the younger age groups probably arise from vestigeal structures related to the epididymis like the appendix of the epididymis, the paradidymis and the appendix testis. The acquired cysts which are larger and found in the older age groups probably arise from obstruction to the passage of spermatozoa along the vas causing dilatation of the thinner walled parts of the testicular duct system such as the efferent ductules and the epididymal tubules. The cause of the obstruction could be the sequalae of various forms of epididymitis extending to involve the vas: gonococcal, tuberculous and pyogenic infections probably account for the most.

Sperm Granulomas

Twenty one cases of sperm granulomas were encountered in this series. The most frequent site was

in relation to the head of the epididymis, but four were related to the cord; these lesions occurring with equal frequencies on either sides. The largest of these granulomas measured 3 cms. in diameter, and was mistaken clinically for tuberculosis as were several others. There was a wide age scatter from the second decade to the oldest patient who was in his sixth decade. The peak, however, was found between the third and fourth decades.

Histologic examination reveals a granulomatous reaction with the centre containing spermatozoa surrounded by a chronic inflammatory infiltrate (Fig. 1). The pathogenesis of the lesion has been postulated to be the result of rupture of epididymal tubules as a consequence of either trauma or inflammation (5). The granulomatous nature of the lesion may resemble non-caseating tubercles if the presence of spermatozoa is overlooked. Spermatozoa have been shown to contain an acid-fast fraction of lipid and this may be the reason why they elicit a resemblance to tuberculous inflammation (6).

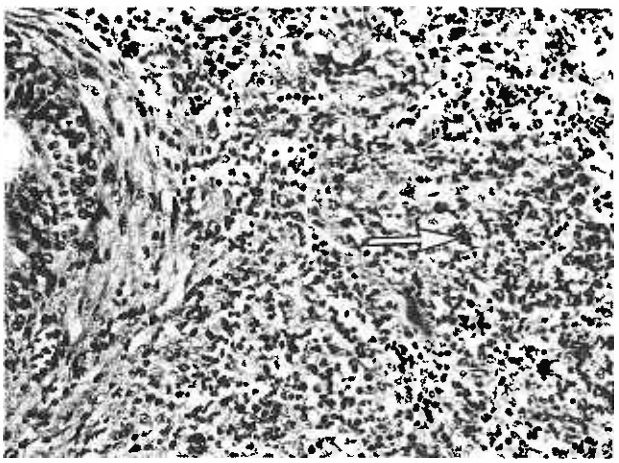

Fig. 1. Sperm Granuloma. Extravasated spermatozoa (arrow) surrounded by a dense eosinophilic inflammatory infiltrate. H & E x 180.

Acute epididymitis

A pathologic diagnosis of acute epididymitis with or without involvement of the testis was made in forty-one cases. The ages of the patient ranged from fourteen to sixty-three with the peak incidence in the third and fourth decades. Pain and scrotal swelling were the presenting symptoms in the majority; some, however, complained only of the swelling. There was a surprising, but unexplained preponderance for the right side - 29/41 (70.7%) of all cases in this series.

On gross examination, the epididymis appears enlarged, the consistency varying from soft to firm, with areas of frank suppuration at times, and the more extensive lesions extending to involve the testis. Histologic examination shows varying amounts of acute inflammatory infiltrate, congestion and oedema, formation of microabscesses and more confluent areas of suppuration often involving the testis. Bacterial cultures were not studied in the majority of the cases and as such it is not possible to report on the spectrum of the microorganisms involved. However, in some of the patients who gave a history of venereal exposure, gonococci were identified in urethral smears.

Chronic Non-Specific Inflammation

A non-specific chronic inflammation of the epididymis formed a substantial proportion of cases in this series - 53/328 (16.2%). Scrotal swelling sometimes associated with pain apparently of recent onset were the presenting complaints in several cases. While the right side was again more often involved, this bias was less striking than in the acute lesions previously described. Microscopic changes comprised of varying amounts of chronic inflammatory infiltrate, fibrosis, destruction of the efferent ductules and formation of microcysts. The pathogenesis of these lesions is debatable and probably varied. It may be the end result of previous acute inflammation. However, syphilis, "burnt-out" tuberculosis, inflammatory fibrosing reaction to old sperm granulomas, and filarial infestations may all have to be considered in the differential diagnosis. On the whole, however, pathognomic findings are absent, and a non-committal report of chronic epididymitis is all that may be possible.

Granulomatous Inflammation

Granulomatous inflammation, chiefly of the epididymis, constituted 69/328 (21%) of the cases. There were 34 cases of tuberculosis, 22 of filarial granulomas, and 13 cases where a specific aetiological diagnosis was not possible.

Tuberculosis represented in this series as an isolated organ involvement in the majority of the patients while in the few there was a history of co-existing pulmonary, renal or bladder involvement. The youngest patient was three years old and the oldest seventy-one. Two peaks were observed, one in the second decade (11 cases) and the other in the fourth decade (12 cases). There was no predilection for any particular side. The presenting symptom was that of scrotal swelling of one to five months duration. Operative findings were generally those of an irregularly enlarged hard mass about the epididymis. The largest of these lesions occurred in the youngest patient where the whole of the testis and epididymis was described as being involved by tumour.

Microscopically, these lesions are readily identified in most instances by the classical histologic features. In some cases these granulomas appeared initially to be of the non-caseating type and only after serial sections were taken was caseation demonstrable. Acid-fast bacilli can occasionally, though not as a rule, be demonstrated in these lesions, and in this context the demonstration of the organisms in tissue may be enhanced by examining thick sections. Whether or not acid-fast bacilli are identified, it is advisable to consider all caseating granulomas as probably tuberculous until otherwise proved.

The ages of the twenty-two patients with filarial infestations ranged from twelve to sixty-seven years with a peak in the third to fourth decades. Both sides were equally affected and the presenting symptoms

were scrotal swelling, frequently with pain, and sometimes with an associated hydrocoele. Generally, the operative finding was that of an irregular hard thickening of the epididymis with or without involvement of the cord. In one case the specimen appeared as a multiloculated epididymal cyst measuring 3.0 x 2.5 x 1.5 cms. containing milky fluid. The correct preoperative diagnosis often appeared to be difficult and malignancy was queried on several occasions.

Histologically a definitive diagnosis is possible if the sections examined show a granulomatous reaction composed of a heavy eosinophilic infiltrate with presence of the parasite (Fig. 2). A heavy granulomatous eosinophilic infiltrate but without the actual presence of the parasite can only be suggestive of filariasis and requires further laboratory examination.

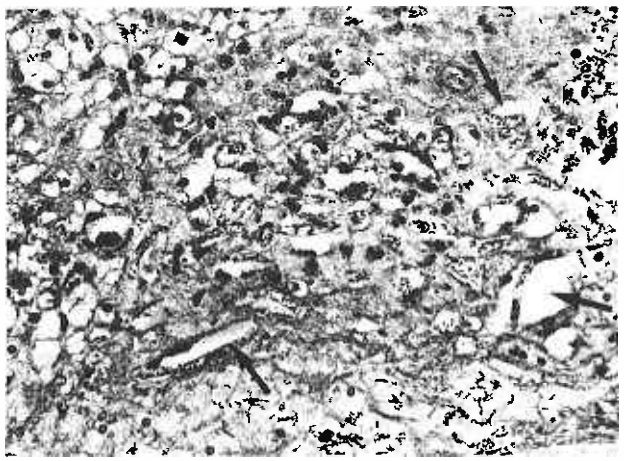

Fig. 2. Filarial granuloma. Sections of several larvae can be seen (arrows) surrounded by inflammatory cells. H & E x 280.

Non-specific granulomatous inflammation diagnosed in 13 cases probably represents an aetiologically heterogeneous group. These lesions could well be the late sequelae of a variety of primary injuries to the para-testicular adnexa which at the time of pathologic observation defies precise categorisation. The initial damage could be trauma or specific granulomatous lesions where the aetiology can no longer be discernable.

Congenital Malformations

Seven cases of congenital malformation of paratesticular adnexa usually associated with testicular anomalies were encountered in this series. Atresia of the testis with epididymis was the most common structural abnormality, accounting for six cases. These were young patients, their ages varying from five to eighteen. The oldest patient, who was thirty-four, presented for investigations for primary infertility, and was found to have an absent left epididymis and vas deferens.

Varices

There were only 31 cases of varices in this study and this probably because not all such specimens are usually submitted for pathologic examination. As such, analysis of these cases may be misleading, and all that needs to be said is that they all showed the characteristic dilated tortuous vessels as described in the routine texts.

Tumours

Tumours of paratesticular structures are uncommon (7, 8). Benign tumours predominate, while malignant tumours are so rare that they have only been the subject of occasional case reports. Thirty-one tumours were encountered in the present series, all of them benign. There were 7 cases of adenomatoid tumours, 7 leiomyomas, 6 each of lipomas and "lymphangiomas", 2 each of papillary cystadenomas and fibrous pseudotumours, and one case reported showed histologic features that was given the descriptive name of angiomyxolipoma. This overwhelming preponderance of mesenchymal tumours (with exception of the two cases of papillary cystadenomas) is not surprising when it is appreciated that the whole of the spermatic cord system has genesis from embryonal mesoderm.

Of the six cases of lipomas, all were situated in relation to the spermatic cord, as were six of the seven leiomyomas - the single extra spermatic cord leiomyoma occurred in the epididymis. Adenomatoid tumours which are reported to be the commonest tumour of the epididymis (9) is in keeping with the findings in the present study where it constituted 7/12 (58.3%) of all epididymal tumours. These tumours which have been established to be of mesothelial nature (10) were found in the third to fourth decades, the patients presenting with asymptomatic scrotal swellings that rarely exceeded 1.5 cms. in diameter. Diagnosis at operation varied from chronic tuberculous epididymitis to "fibromas". The correct histologic diagnosis can usually be established if sufficient sections are studied with the knowledge of morphological variants than can be encountered in these tumours.

Two other rare and histogenetically preplexing tumours are fibrous pseudotumours and papillary cystadenomas. Both cases of fibrous pseudotumours occurred in the epididymis and appeared as firm fairly well demarcated nodules. Microscopically these lesions are composed of proliferating fibroblasts in a stroma containing numerous thin walled capillaries and usually associated with a chronic inflammatory infiltrate (Fig. 3). These lesions are considered to be non-neoplastic though they may be mistaken for neoplasms. A history of previous trauma or epididymo-orchitis have been recorded in about 30% of the patients (11).

The two cases of unilateral papillary cystadenomas of the epididymis occurred in patients aged fifty and fifty-nine respectively. These tumours which arise from the efferent ducts of the epididymis are usually well circumscribed, and may appear either cystic or solid. Histologically, their appearance is distinctive with papillary processes lined by columnar cells with clear cytoplasm (Fig. 4). Papillary cystadenomas are said to represent the epididymal component of Lindau's disease (12). Patients with bilateral epididymal cystadenomas may be prone to acquire other

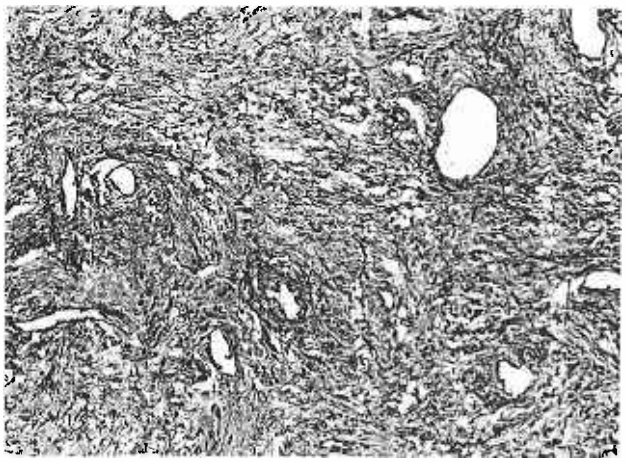

Fig. 3. Fibrous pseudotumour. Loosely textured fibrous tissue within which are numerous thin walled capillaries. A sparse chronic inflammatory infiltrate is present in the fibrous tissue. H & E x 70.

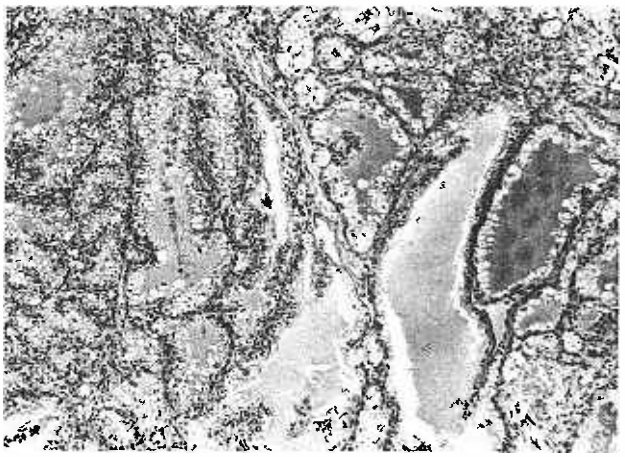

Fig. 4. Cystadenoma of the epididymis. Ectatic efferent ducts with gland like spaces lined by columnar cells with clear cytoplasm. The lumens in some areas are filled with eosinophilic homogeneous material. H & E x 70.

stigmata of the Hippel-Lindau Syndrome, and as such a thorough clinical examination is indicated in such patients. However, unilateral epididymal involvement may be regarded as a "forme fruste" of the disease and such patients are not prone to manifest other lesions of the syndrome (13).

CONCLUSION

The clinical interpretation of a scrotal mass may often be a problem. They are rightly viewed with concern especially if such lesions appear to be of testicular origin as gonadal malignancy is not uncommon. However, it is often difficult to differentiate at the bedside a testicular from a paratesticular mass. The results of the present study have shown that if at operation the scrotal enlargement is proved to be extra-testicular, then the likelihood that one is dealing with a tumour is considerably diminished. Such lesions are more prone to be of inflammatory or of non-neoplastic aetiology. Even if neoplastic lesions are encountered the chances that they are malignant are exceedingly remote. Aggressive surgery, therefore, for paratesticular lesions should only be considered after pathologic examination dictates such a need. It is hoped that the present study also offers to the surgeon a more meaningful guide when dealing with the diseased paratesticular adnexa.

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