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Case Reports

Role of Fine Needle Aspiration Cytology in Diagnosis of Phylloides Tumour of the Breast

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SUMMARY

Phylloides tumour is a rare fibroepithelial tumour, which stands half-way between benign and malignant tumours of the breast. This tumour has an unpredictable clinical behaviour. Accurate pre-operative diagnosis is important, as surgical management of these tumours differs from fibroadenomas and carcinomas. From January 1991 to December 1994, 493 palpable breast lesions were aspirated. Out of these 320 were breast tumours including 3 cases of phylloides tumour (0.94%). Validity of the fine needle aspiration cytology technique was assessed in these 3 patients with breast masses. Surgical treatment was carried out based on these findings. Subsequent permanent histological sections from the resected specimens confirmed these as phylloides tumours. Therefore, fine needle aspiration cytology is strongly recommended and should be routinely applied for the pre-operative diagnosis of these lesions.

INTRODUCTION

Phylloides tumour is a rare breast tumour that represents only 0.3 to 0.9% of mammary tumours[1]. It stands halfway between benign (fibroadenomas) and malignant (carcinomas) tumours and presents considerable difficulties in terms of diagnosis, particularly problematic for the small sized lesion[2]. A strong association between phylloides tumour and fibroadenomas has been reported[3]. Probably half of these tumours are considered to arise from previous fibroadenomas[4]. Many of these tumours are radiologically indistinguishable from fibroadenomas and it is not possible to predict their behaviour on the basis of clinical and radiological features alone[3]. Phylloides tumour is composed of breast ducts and a cellular stromal component that can be benign or malignant[5]. Older age, nulliparity, rapid tumour growth, pain, large tumour size, overlying skin ulceration, tumour necrosis and infiltrating tumour margins are reported to be the most ominous characteristics associated with an increased suspicion of malignancy. Still the clinical course in most of these lesions is unpredictable[6].

The treatment of these tumours is very variable, ranging from tumour enucleation in juvenile cases with small tumours[7] and tumour removal with wide excision of healthy breast tissue[2] to mastectomies in older patients or with large voluminous tumours[6]. The diagnostic procedure, fine needle aspiration cytology is a method free of complications, is convenient, quick, simple and is cost effective. It provides opportunity for evaluation of the patient on an out-patient basis as well as a full discussion of treatment options prior to intervention[8]. It is a harmless technique which should be routinely applied in the diagnostic pathology[9]. The correct pre-operative diagnosis of phylloides tumour is very important because the surgical therapy of these lesions is strictly individualised[10]. Usefulness of fine needle aspiration technique in making a correct pre-operative diagnosis of phylloides tumour was assessed.

PATIENTS AND METHODS

From January 1991 to December 1994, a total of 493 palpable breast lesions were aspirated. Out of these, 320 were breast tumours including both

benign and malignant tumours. Only 3 cases of phylloides tumours were diagnosed.

The first patient was a 13 years old female with a history of painless lump in left breast for one year and a recent increase in size. On clinical examination there was a soft to firm mobile and discrete mass approximately 7 cm across, in the medial portion of the breast. The skin over the mass was intact, stretched and showed prominent veins.

The second patient was a 70 years old female. She presented with a large lump, approximately 10 cm across in her right breast with retracted nipple.

The third patient was aged 40 years. She gave a 4 years history of swelling in her left breast, gradually increasing in size with a recent history of nipple discharge. On clinical examination, approximately 10 cm nodular mass was noticed in the middle of her left breast, with evidence of surface ulceration. Left axillary lymph nodes were enlarged.

In all these cases fine needle aspiration of the tumours was carried out in the outpatient department. Multiple sites from each case were aspirated, so as to obtain sufficient material for diagnosis. In each case spread smears were made from the aspirated material and few slides were immediately fixed in ethanol. The remaining slides were air-dried. The ethanol fixed slides were papanicolaou stained, while the air dried smears were stained with Giemsa stain after fixation in ethanol. A cytological diagnosis was made after screening and carefully examining all these slides.

i. Lumpectomy was carried out in the first case and revealed an encapsulated mass measuring 7×5×3 cm, with firm grey nodular cut surface.
ii. Simple mastectomy specimen in the second case revealed a retracted nipple and a grey white circumscribed tumour measuring 11×9×7 cm, with cystic and haemorrhagic areas.
iii. Simple mastectomy and left axillary lymph node sampling was carried out in the third case. A 2 cm ulcerated area was seen near the nipple. There was a circumscribed, lobulated tumour measuring 16×11×4 cm, with grey white cut surface showing areas of necrosis.

These surgically resected specimens were fixed overnight (specially the mastectomy specimens) in 10% formalin, representative blocks taken, routinely processed and embedded in paraffin. Sections were stained with H&E method[11]. A histological diagnosis was made and then compared with the cytological findings for evaluation.

RESULTS

Examination of the spread smears made from the aspirated material from these three cases revealed many cohesive sheets of benign ductal epithelial cells and stripped nuclei, showing some pleomorphism (Fig. 1). The pathognomonic abundant loose fibrous connective tissue fragments with plump, spindly, pleomorphic fibroblasts containing oval or elongated plump nuclei were identified (Fig. 2). Scattered single stromal cells with similar morphology were also seen (Fig. 3). In addition in one case many branching capillary vessels were also present (Fig. 4).

Based on these cytological findings, preoperative diagnosis of phylloides tumour was made in all three cases.

On histological examination of the resected specimens, the diagnoses were confirmed. Two of these lesions were benign, while the mastectomy specimen from the third patient aged 40 years revealed a malignant phylloides tumour.

DISCUSSION

Phylloides tumour is an uncommon breast neoplasm which stands halfway between benign (fibroadenoma) and malignant (carcinoma) tumours. Out of 493 palpable breast lesions aspirated, 320 were breast tumours including 3 phylloides tumours. Therefore, the incidence of phylloides tumours in our patients was 0.94%. This lesion presents considerable difficulties in terms of diagnosis, particularly for the small sized lesion[2]. Clinical behaviour of this tumour is unpredictable[12] and the surgical treatment varies from simple excision to wider resection of the surrounding healthy breast tissue and even mastectomy. As surgical management should be strictly individualised[10], so correct diagnosis of the lesion before any surgical treatment is undertaken becomes imperative.

Frozen section technique is expensive, not always available and can lead to over-diagnosis of malignancy[4]. Fine needle aspiration cytology plays a significant role in this setting. All the 3 cases in our series were diagnosed on fine needle aspiration

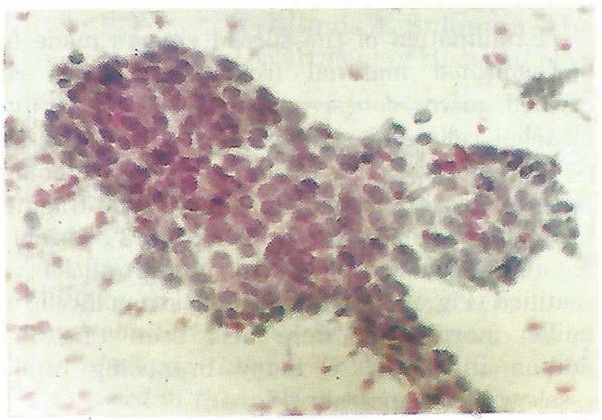

Fig. 1: **Cohesive sheet of benign ductal epithelial cells with minimal cellular and nuclear pleomorphism (papanicolaou, x231).**

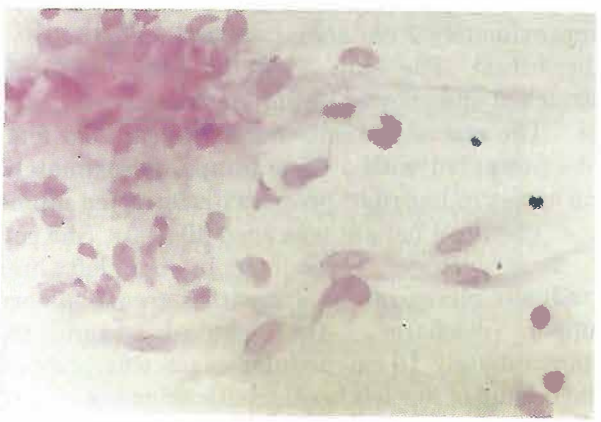

Fig. 3: **Higher magnification showing single, plump, spindly stromal cells with oval or elongated nuclei (Giemsa, x462).**

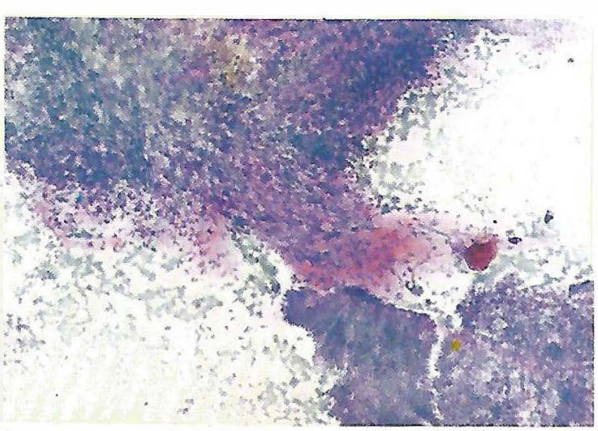

Fig. 2: **Extremely cellular, loose fibrocollagenous tissue with spindly, elongated stromal cells (Giemsa, x115).**

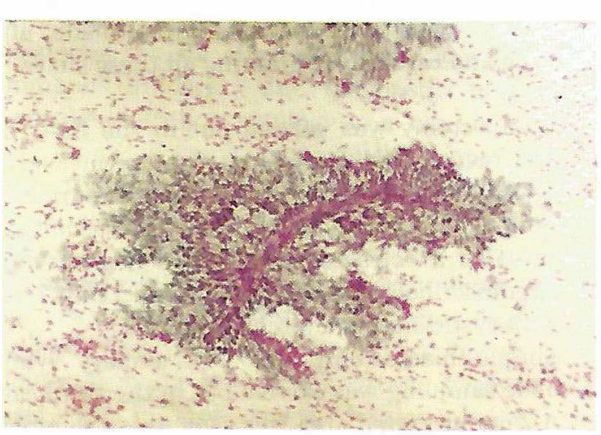

Fig. 4: **Papillary fragment of loose, cellular stromal tissue traversed by branching capillaries (Papanicolaou, x115).**

cytology correctly and confirmed subsequently when histological sections of the resected specimens were examined.

One of the difficulties with the cytological diagnosis lies in the similarity of phylloides tumour and fibroadenoma[12]. In addition to many cohesive

sheets of ductal epithelial cells with a honeycomb appearance and many stripped nuclei, the hallmark of fibroadenoma is the presence of abundant bright pink fibrous connective tissue fragments containing thin, mature fibroblasts. Blood vessels are rarely seen. Although in phylloides tumour, sheets of epithelial cells are quite similar to those seen in fibroadenomas with many stripped bipolar nuclei in the background, but these nuclei show pleomorphism and tend to vary in size and shape. The differentiation rests on the presence of different type of fibrous connective tissue derived from the stromal component of the tumour. In cases of phylloides tumour, the stromal fibrous connective tissue is very loose and has large numbers of plump, spindly fibroblasts, with oval or elongated plump nuclei. Many blood vessels may be seen in this connective tissue[13].

In the first two patients in our series, despite quite cellular aspirates and abundant cellular fibro-connective tissue, there was minimal cellular and nuclear pleomorphism and no mitotic figures were seen. So these lesions were diagnosed as benign phylloides tumours. Based on pre-operative diagnosis, the young girl aged 13 years with a smaller breast lump was subjected to lumpectomy with resection of a small rim of surrounding healthy breast tissue. The 70 years old female with a benign phylloides tumour had a larger lump with a retracted nipple and she was subjected to mastectomy, as older age and larger size of these tumours are associated with increased suspicion of malignancy[6]. These two cases were confirmed on permanent histological sections as benign phylloides tumours. Histologically the stroma revealed a variable picture comprising of foci of very cellular stroma, to fibrotic hyalinised areas. This finding highlights the importance of multiple punctures from different areas of the tumour to obtain adequate aspirate, as sampling error may lead to false diagnosis.

Mastectomy was done in the 3rd case because of the larger size of the tumour, history of recent increase in size and presence of overlying ulcerated skin. All these parameters are associated with increased suspicion of malignancy[6]. Histologically, because of the presence of increased number of mitoses and atypia of the stromal cells, this lesion was reported as malignant phylloides tumour. Retrospective review of the cytological slides revealed papillary sheets of plump stromal cells with cellular and nuclear pleomorphism, many branching capillaries and scattered mitoses. These are features of malignant phylloides tumour. As the definite criteria of malignancy in this tumour is the number of mitoses alongwith cytological atypia[4], and this cannot be assessed accurately on cytological smears, so a diagnosis of phylloides tumour was made with the comments that malignancy will be evaluated on histological sections.

CONCLUSION

All the three cases of phylloides tumour in our series were correctly diagnosed on fine needle aspiration cytology. Many of the phylloides tumours are radiologically indistinguishable from fibro-adenomas and it is not possible to predict tumour behaviour on the basis of clinical and radiological features alone.

A correct pre-operative diagnosis of phylloides tumour is imperative for the appropriate management which should be strictly individualised. Frozen section technique is expensive, not always available and can lead to over-diagnosis of malignancy. In comparison, fine needle aspiration cytology was found to be very economical, quick and reliable method for the accurate pre-operative diagnosis of these lesions. Therefore, in these settings this technique is strongly recommended.

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