Surgical Resection of Phyllodes Tumour: a Radical Approach as a Safeguard Against Local Recurrence

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Received: 7 May 2013 / Accepted: 10 June 2013 / Published online: 26 June 2013
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Abstract Phyllodes tumour is a rare benign neoplasm of the breast. It is a mixed tumour of epithelial and mesenchymal origin. The epithelial element is characterized by proliferation of ductolobular units. The fibrous tissue and collagen bundles represent the mesenchymal element. It is also known as “cystosarcoma” phyllodes to characterize some important features, viz. cyst-like or cleft-like spaces within the mass along with a leaf- or frond-like pattern of the stromal element. The tumour is well known for its high potential for local recurrence. Most patients in developing countries present with very large breast tumours with close proximity to the skin and pectoralis major. In these cases, there is a need to perform a three-dimensional en bloc removal of the mass with overlying skin and underlying muscle(s). If a skin flap is raised in the vicinity of the tumour, there is a risk of cutting close to the tumour, increasing risk of local recurrence. Here, we describe a surgical technique that permits a three-dimensional en bloc removal of phyllodes tumour.

Keywords Phyllodes tumour · Radical surgery · Wide local excision · Cystosarcoma

Introduction

Johannes Muller described a tumour of the breast in young women in 1838 where the mass would assume a very large dimension with stretching of overlying skin and dilated prominent veins [1] (Fig. 1a). He named it “cystosarcoma”

to characterize some important features, viz. cyst- or cleft-like spaces within the mass along with a leaf- or frond-like pattern of the stromal element. Since then, 62 different names have been ascribed to this soft tissue tumour, sometimes know by the eponym “Muller's tumour”. Today, WHO recognizes it as “phyllodes tumour”. The word “phyllode” is derived from Latin *Phyllodium* and Greek *phulloses* meaning leaf like.

The tumour is well known for its high potential for local recurrence. In order to curb down the risk of local recurrence, many surgeons have devised a radical surgical approach. Here, we describe a method evolved at Tata Memorial Hospital, Mumbai, by Professor RA Badwe. Excision of the tumour with a wide margin of healthy tissue is regarded as a safe and effective method of local control for women presenting with phyllodes tumour. There is some disagreement among experts about the width of margin needed, 1 or 2 cm, for reducing the risk of local recurrence. Many authors regard a 2-cm gross margin as safe [2, 3]. The long-term results of patients treated by this technique will be presented separately.

Surgical Technique

Patients with large phyllodes tumour are managed with a “radical mastectomy” whereas women with a small lesion are treated with a wide local excision with a 2-cm margin of healthy breast tissue all around the lesion. Here, the term “radical” connotes the radicalism in excision of tumour down to the chest wall including the pectoralis major muscle. It is different from Halsted radical mastectomy for adenocarcinoma in that the axillary nodes are not removed in a phyllodes tumour. Steps: The scrub nurse is instructed to remove any skin hook from the instrument trolley (Fig. 1b), lest some resident should start raising a skin flap close to the tumour,

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Fig. 1 **a** A large phyllodes tumour 28 by 25 cm across in a 48-year-old lady. **b** Skin hooks or small skin retractors are removed from the operation trolley. This avoids an inadvertent raising of the skin flap very close to the tumour

thus compromising the margin of clearance. The skin incision is marked with an exact 2-cm margin from the palpable edge of the tumour using a ruler (Fig. 2a). For deep-seated lesions, the tumour margins may be defined and marked on the skin

Fig. 2 **a** The palpable margins of the tumour have been marked on the skin. The incision is marked outside the tumour margin, precisely at 2-cm distance with a ruler. **b** The skin incision is deepened vertically downward towards the chest wall. The fibres of the pectoralis major muscle are divided in the same vertical plane. **c** The pectoralis major muscle fibres being divided controlling large tumour blood vessels

Fig. 3 **a** The tumour resection bed displaying ribs, intercostal muscles and serratus anterior muscle. **b** The tumour specimen en bloc overlying skin and underlying muscle fibres

with an intraoperative ultrasound probe. The incision is deepened through the breast and pectoralis major muscle, and the mass is excised “en bloc” with a three-dimensional clearance of all sides. The underlying pectoralis major muscle is

included in the resection (Fig. 2b, c). The pectoralis minor muscle is also removed if the tumour is seen to infiltrate the pectoralis major. If the tumour is located in the lower outer quadrant, the underlying slips of serratus anterior muscle should also be excised en bloc with the tumour. The resection wound thus created is akin to a “punched-out ulcer” with its edges oriented vertically towards the chest wall (Fig. 3a). A large defect is repaired with a myocutaneous flap. Small defects are closed by mobilizing the surrounding skin using “far and near tension sutures” with polydioxanone (PDS) or polyglactin suture. In many cases, it is possible to accomplish primary closure because the surrounding skin is overstretched by the phenomenon of “tissue expansion”. The wound cavity is drained with a vacuum suction drainage system.

Discussion

Phyllodes tumour is a rare benign neoplasm of the breast. It is a mixed tumour of epithelial and mesenchymal origin. The tumour lacks a true capsule and is characterized by infiltrative borders [3]. A pseudocapsule of compressed surrounding normal tissue contains microscopic projections of tumour cells; hence, more tissue is required to be removed in the margin to obtain histological 1-cm margins [4]. Hence, these tumours are treated with an aggressive radical surgery with at least 2 cm gross margin of excision. The famous breast pathologist, Azopardi, has described three categories of phyllodes tumour, based on grade of differentiation:

1. Benign (mitotic rate <4/10 high-power field), which behaves like a fibroadenoma and can be treated with enucleation or minimal margin of normal tissue around it.
2. Borderline or intermediate type (mitotic rate 4 to 9/10 high-power field), locally infiltrating with a pseudocapsule formed by compressed normal breast tissue—treated with wide local excision with a 1–2-cm margin of healthy tissue around it.
3. Malignant type (mitotic rate >10/10 high-power field). These behave like a malignant sarcoma and should be treated aggressively with a wider excision like a sarcoma.

Phyllodes tumours can recur regardless of their histological type although the risk of recurrence is low in the benign form, ranging from 4.7 to 30 %, and notably higher in borderline and malignant forms (30 to 65 %) [3, 4].

Since most patients in Asia present with very large breast tumours with close proximity to the skin and pectoralis major, we ought to perform a three-dimensional en bloc removal of the mass with overlying skin and underlying muscle(s). A wide local excision (for a small mass) and a “*radical* mastectomy” for large masses should be followed by radiotherapy if the histological features point towards malignancy. Another indication of radiotherapy is a case of recurrent tumour [5]. Adjuvant radiotherapy in a multicentre study of 46 patients has been found to reduce the risk of local recurrence to zero [5].

Axillary lymph node enlargement is seen in 10 % of cases of phyllodes tumour. However, histological involvement of nodes is seen only in 2–5 % of cases [4]. Hence, a sentinel node biopsy or axillary lymph node dissection is not undertaken. However, an axillary sonography may be carried out preoperatively. Any sonographically suspicious or palpable node should be subjected to needle aspiration. A positive node for metastasis would necessitate an axillary lymph node dissection followed by chemotherapy and radiotherapy. Metastases are always from the mesenchymal element; hence, they behave like a “pure sarcoma”. The following drugs have been described to be effective for malignant phyllodes: ifosfamide, cisplatin and etoposide [4].

Conflict of interest None.

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