

Technique for Axillary Dissection: Use of the Bookwalter Retractor

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ABSTRACT

The axillary lymph nodes most at risk for the spread of carcinoma of the breast are nodes caudad to the axillary vein. For patients whose treatment for stage 1 or 2 carcinoma of the breast is conservative, a standard technique for level I and II axillary node dissection permits the retrieval of a relatively constant number of nodes, preservation of anatomic structures of the axilla, accurate nodal staging, and prevention and treatment of axillary node disease with low morbidity. The use of the Bookwalter retractor permits prolonged periods of exposure, allows versatility in the placement of the blades, and obviates the need for a second surgeon, thus lowering the cost of operation and enabling active participation from a resident in training. [Contemp Surg 42(3):189-193, 1993.]

INTRODUCTION

Carcinoma of the breast is the most common indication for axillary node dissection, which may be performed as part of a mastectomy in which the pectoralis muscles

may either be preserved or sacrificed according to the procedure used. Axillary node dissection also can be performed through a separate incision after a breast-conserving procedure (lumpectomy). Axillary nodes are divided into three levels according to their relation to the pectoralis minor muscle. Level I includes approximately ten nodes lateral to the pectoralis minor muscle; level II includes approximately nine nodes beneath the pectoralis minor muscle; level III includes approximately five nodes medial to the muscle (Fig. 1).

Surgery for carcinoma of the breast has evolved during the past decade, and breast-preserving procedures are being performed with increasing frequency. A similar decrease in the extent of axillary surgery should be accepted cautiously.¹ Although the extent of axillary node dissection might not have an impact on survival in the patient with clinically negative nodes,² 16-37% of patients with stage 1 or 2 carcinoma who do not receive any form of axillary treatment will present with recurrent disease in axillary nodes.³⁻⁵ Axillary node dissection provides control and prevention of recurrent disease in the axilla. Assessment of axillary nodal status is essential for staging purposes, especially in patients with tumors less than 1cm⁶⁻⁹ and those with node-negative disease who do not require adjuvant systemic treatment.

Extent of Axillary Node Dissection

Axillary node dissection should produce adequate control and prevention of recurrent disease in the axilla,

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Axillary Dissection

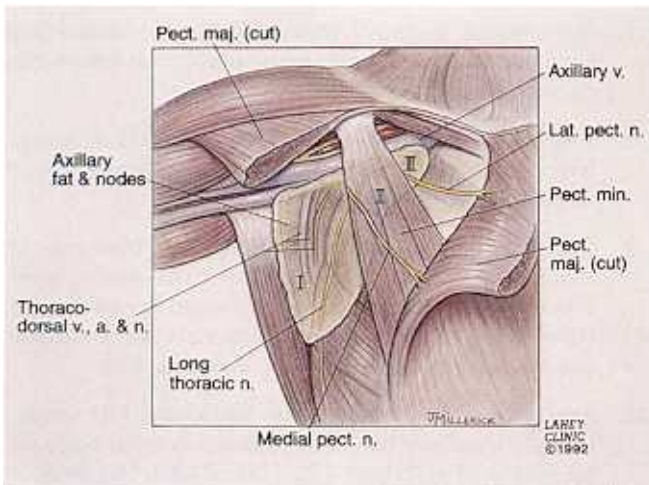


Fig. 1 The relationship of the axillary levels to the pectoralis minor muscle.

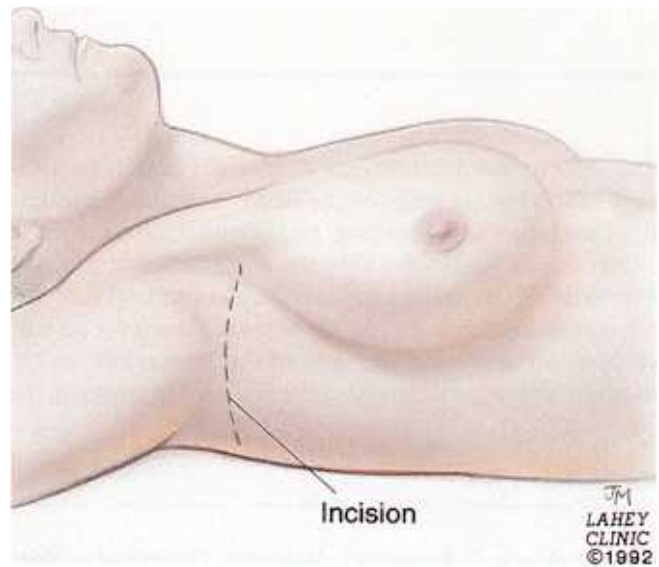


Fig. 2 The incision is shown.

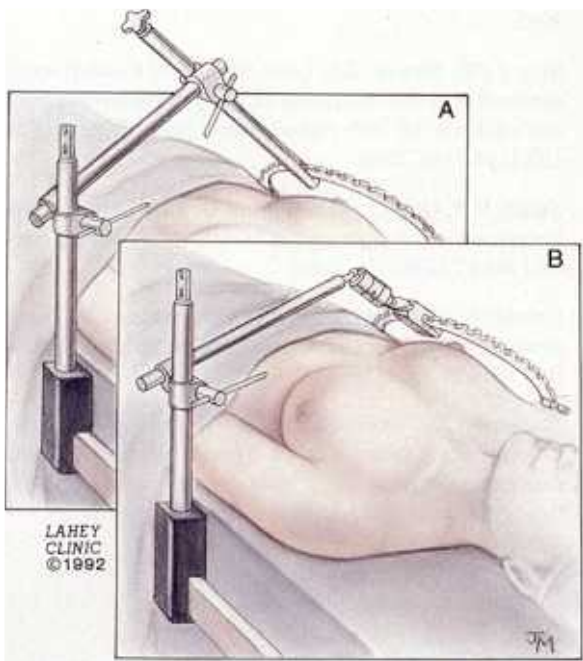


Fig. 3 Positioning of the post and the ring of the Bookwalter retractor.

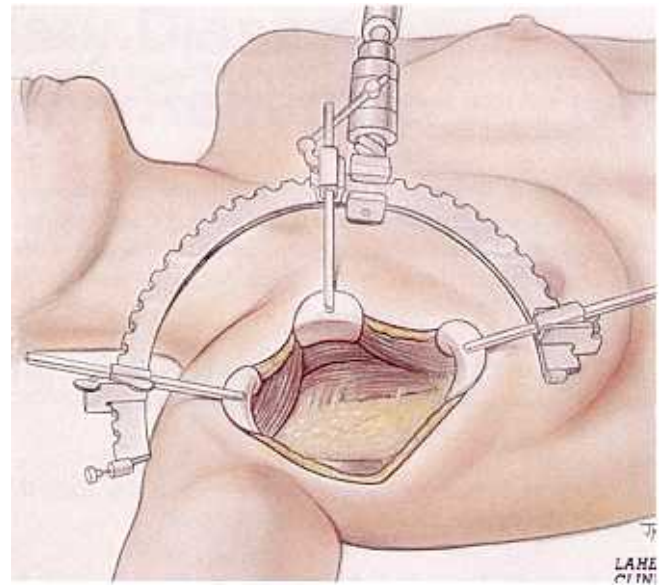


Fig. 4 Exposure of the operating area is shown after placement of the blades.

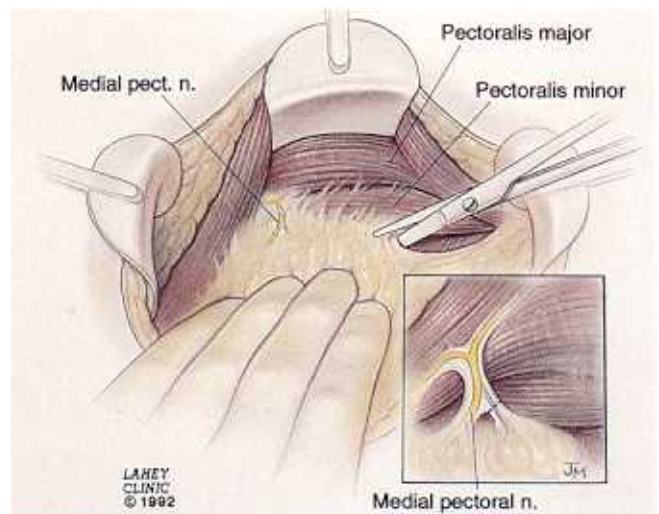


Fig. 5 Dissection of the axillary fat pad with preservation of the medial pectoral nerve.

Axillary Dissection

achieve reliable and accurate information about axillary nodal status, and produce minimal morbidity. The presence of skip metastases (i.e., positive nodes at level II or III with negative nodes at level I) can cause understaging in up to 29% of patients when a sampling of axillary nodes is performed.^{10,11} Dissection of nodes at levels I and II accurately stages disease in the axilla in 98% of patients and achieves excellent regional control with low morbidity.^{12,13}

Technically, continuous retraction of the pectoralis muscles during axillary dissection limits active participation of the resident or requires a second operating room technician and is tiresome. A technique for dissection at levels I and II using the self-retaining Bookwalter retractor is described.

OPERATIVE TECHNIQUE

The patient is placed in the supine position with the arm extended to 90°. The surgeon stands below the arm, and the assistant stands above the arm, with the opposite side free for placement of the retractor. After the shoulder, arm, chest, and axilla have been prepared, a transverse incision is made from the lateral edge of the pectoralis major to the latissimus dorsi muscle. The incision is carried down, and flaps are raised (Fig. 2). The lateral edge of the pectoralis major muscle is dissected to the fascia. The dissection continues below the pectoralis major muscle to identify the pectoralis minor muscle. The fatty tissue between pectoralis muscles is entered, and the pectoralis minor muscle is exposed caudad to cephalad.

The Bookwalter post is fixed to the opposite side of the operating table, permitting assembly of the segmented ring over the axilla (Fig. 3). A retractor blade is placed beneath the pectoralis major muscle medially. Two other blades are placed cephalad and caudad, permitting adequate exposure of the operating area (Fig. 4).

As the lateral edge of the pectoralis minor muscle is being dissected free toward the axilla, care is taken to preserve the medial pectoral nerve that curves around the pectoralis minor muscle. The small vessels tenting the nerve down into the axillary fat pad are clamped and divided. The medial pectoral nerve is freed from the axillary pad and retracted with the muscle, pulling the nerve up and off the anterior aspect of the axillary vein (Fig. 5). The axillary vein is identified medially and, with use of sharp dissection, is followed on the anterior surface to the lateral edge of the latissimus dorsi muscle. This muscle is dissected until the white tendon is identified below the axillary vein. The fat and lymphatic vessels caudad to the axillary vein and anterior to the latissimus dorsi are clamped and ligated. The pectoralis minor and major muscles are retracted by placing the central blade be-

neath the pectoralis minor muscle, and the fat pad beneath the pectoralis minor muscle is dissected free from the chest wall up to the apex. The small caudad veins from the axillary vein are dissected, ligated, and divided. A clamp is passed around the apex of the fat pad that was dissected from the chest wall, and this fat pad is divided to provide the apex of the dissection (Fig. 6).

The intercostobrachial nerve is identified, divided, and ligated (Fig. 7). Some surgeons save this nerve. The fat pad is separated from the chest wall with blunt dissection, pulling the long thoracic nerve with the fat pad. The long thoracic nerve is identified beneath the fascia and is dissected. The fat pad is moved caudad to reveal the thoracodorsal vessels. Just medial to the vessels, the thoracodorsal nerve is identified and dissected, identifying the fascia of the subscapularis muscle (Fig. 8). A finger is used to push the long thoracic nerve back to the chest wall, and another finger is used to push the thoracodorsal nerve laterally.

The fat pad is encompassed, and several small portions of the apex at the level of the axillary vein are clamped and ligated. A Kelly clamp is placed around the fat pad with its tip against the fascia of the subscapularis muscle, and the fat pad is cut (Fig. 9). The long thoracic nerve is dissected until it inserts into the serratus anterior muscle. Small branching vessels are clamped and ligated to free the thoracodorsal nerve down to its entrance into the latissimus dorsi muscle (Fig. 10). A clamp is placed around the fatty tissue that lies between the thoracodorsal nerve and the lateral edge of the latissimus dorsi muscle. This fatty tissue is divided and taken with the specimen. The specimen is lifted up and dissected from the chest wall, preserving the serratus fascia (Fig. 11).

The wound is irrigated with water, and drains are placed before closure.

DISCUSSION

Axillary node dissection is associated with certain postoperative complications. However, no postoperative complications have been related to the use of the Bookwalter retractor in more than 50 patients. The most common immediate complication is seroma formation. Its incidence ranges from 10-45%.¹⁴ The use of drainage catheters helps to prevent this complication. Treatment is by simple aspiration. Edema of the arm is the most common late complication. The incidence of edema varies from 2-9%,^{13,15} and it is rarely incapacitating.

The advantages of dissection at anatomic levels I and II are identification and preservation of the anatomic structures of the axilla, retrieval of a constant number of nodes (average: 15; lower counts are inherent to anatomic variation and not to inadequate technique),

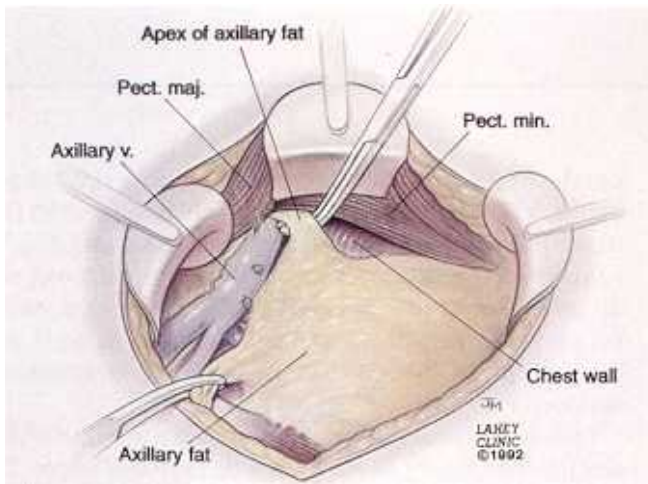


Fig. 6 The axillary vein is dissected, and the apex of the axillary fat pad is ligated.

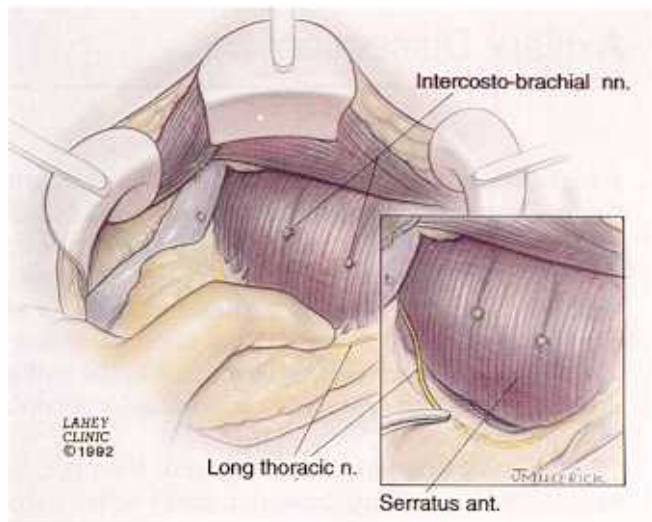


Fig. 7 Division and ligation of the intercostobrachial nerve.

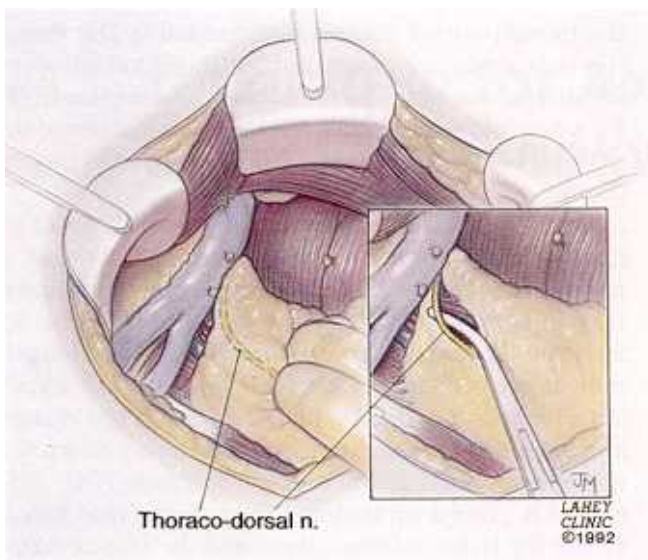


Fig. 8 The thoracodorsal nerve is identified and preserved.

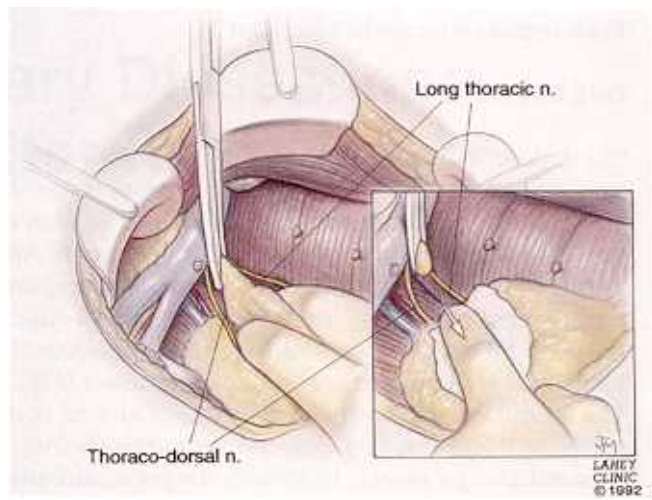


Fig. 9 The tissue between the long thoracic nerve and the thoracodorsal nerve has been removed.

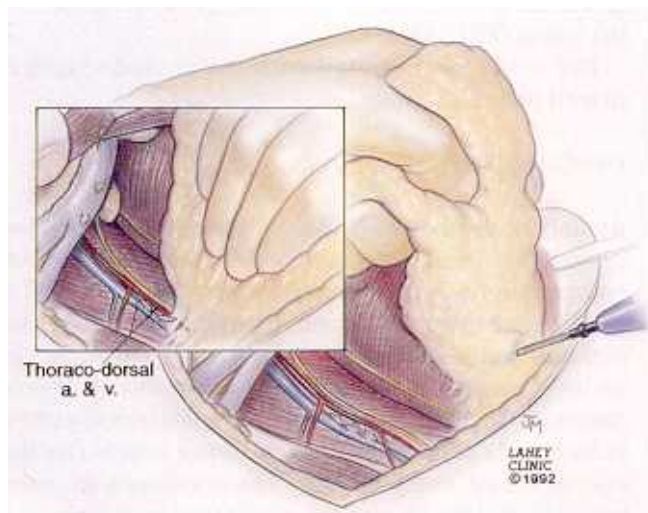


Fig. 10 The small vessels have been sectioned and ligated to free the thoracodorsal nerve.

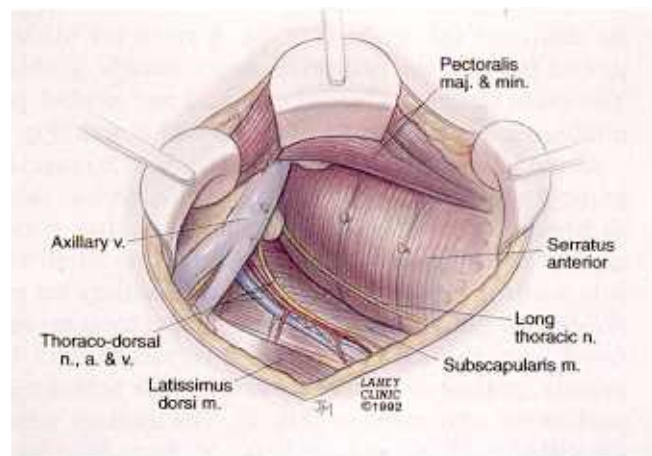


Fig. 11 Axillary lymph node dissection at levels I and II is completed.

low axillary recurrence rate in stages 1 and 2 carcinomas of the breast without the need for axillary irradiation, accurate nodal staging, and minimal morbidity.

The use of the Bookwalter retractor offers prolonged exposure of the axilla with continuous retraction of the pectoralis muscles. Its use obviates the need for another surgeon, lowering the cost of the operation, and it permits active participation by a resident in training.

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