How I Do It

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Axillopexy

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Rezumat

Axilopexia

Lucrarea prezentă este o redare a tehnicii noastre de axilopexie utilizată după evidarea limfoganglionară a axilei la un lot de 29 de bolnave. Intervențiile s-au efectuat pentru cancer mamar. Tehnica s-a aplicat după mastectomie radicală modificată Madden sau după quadrantectomie pentru tumotile din cadranele interne ale glandei mamare. S-au urmărit, comparativ cu un lot martor de 30 de cazuri, durata limforagiei, durata menținerii tuburilor de dren şi prezența/absența altor complicații locale. Deasemena s-a urmărit scurtarea timpului de reluarea a terapiei adjuvante oncologice. Toți aceşti parametri s-au ameliorat prin efectuareaaxilopexiei.

Cuvinte cheie: axilopexie, limforagie, cancer mamar

Abstract

The present paper is a presentation of our technique of axillopexy, used after the excision of the axillary lymph nodes in 29 cases of breast cancer patients. We have used this technique after Madden modified radical mastectomy or after quadrantectomy for tumors in the external quadrants of the mammary gland. We have studied and compared with a 30 case control group, the duration of the lymphorrhagia the moment of removing the drains, the presence/absence of other local complications. We have also measured the time until the beginning of the oncological postoperative therapy. Every one of the aspects we have studied was improved in the axillopexy group.

Key words: axilopexy, limphoragy, breast cancer

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Introduction

After the excision of the axillary lymph nodes, during radical or partial mastectomies, at the end of the intervention the armpit remains visible, pyramidal in shape, and the skin detached from the thoracic wall (*Fig. 1*). There are two muscular planes, which are very visible: the pectoralis major and the latissimus dorsi. Closing this cavity and the postoperative modelling of the region was never an issue for surgeons, who were more preoccupied by finding those techniques capable of saving and prolonging the lives of their patients. Before the era of postoperative oncological therapies, even local complications were not of too much concern for the surgeons. (1)

The surgery of breast cancer was dominated for a few thousands of years by local excision or cauterisation of the tumor, which had nothing to do with the axillopexy technique. From this long period there are references regarding mammary tumor excision or its description in India 4,000 years ago and in 250 BC China, when 4600 years old texts were rewritten (the first known medical book: Huang Ti Nei Ching Su Wen). (2,3)

The Greek phisician Democede described the excision of a breast cancer he had performed on Atossa, the daughter of

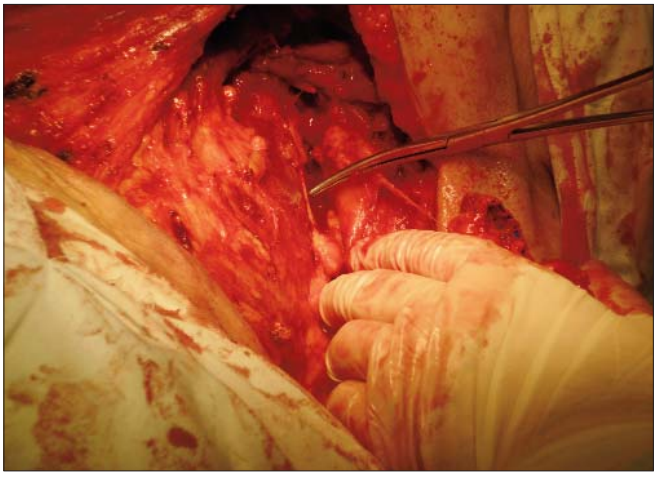


Figure 1. *Limits of the axilla (4)*

the king of Cyprus and wife of Darius, the king of Persia, who lived between 550 and 475 B.C. In ancient Rome, Auleus Cornelius Celsus (25 B.C. – 50 A.D.) operated a breast cancer, ligating the blood vessels, but without the dissection of the axillary lymphatic nodes. The same operation was also performed by the Roman surgeon Leonidas of Alexandria (approx. 100 A.D.), who, along with the tumor, removed the pectoralis major muscle. During the Middle Ages the excision of breast cancer and even the resection of the whole breast continued. We'd like to mention here Guido Lafrancini (1250 - 1306), Henri de Mondeville (1260 - 1320) and John Arderne (1307 - 1392) – the one who described for the first time breast cancer in men.

After 2 or 3 centuries, the operations for breast cancer expanded to the dissection and excision of the axillary lymph nodes and even to the resection of the ribs and pectoral muscles. Such operations were performed by surgeons like Iohannes Sculteus (1595 - 1645) and Lorenz Heister (1683 - 1758). We also mention Adrian Helvetius (1661 - 1727), from the same period of time, who stated that breast cancer can sometimes be cured after a lumpectomy. The understanding of breast cancer took a step forward in 1829 when Joseph Recamier (1774 - 1854) described the metastasis of malignant tumors. (2,4)

The three great titans of surgery of the breast lived during the XIXth and XXth centuries. We are talking about William Stewart Halstedt (1852 - 1922) – author of the radical mastectomy which included the mammary gland, the two pectoral muscles and the axillary lymph nodes, David Patey (1899 - 1977) – author of the modified radical mastectomy (preserving the pectoralis major muscle). John Madden (1912 - 1999) and Hugh Auchincloss (1915 - 1998) who advocated the modified radical mastectomy with the preserving of both the major and the minor pectoralis muscles. These great masters of breast cancer surgery have never proposed the technique of axillopexy, although they were constantly preoccupied by the dissection and excision of the axillary lymph nodes.

The period between 1970 and 1990 was dominated by the figure of Humberto Veronesi who imposed minimal invasive surgery for breast cancer, giving up radical mastectomy in some stages of the disease (stage 1 and 2). (5) The current era, with the interest for the theory and practice of „sentinel lymph node", has begun in 1977 with Ramon Cabanas and was imposed for breast cancer by Giuliano, in 1990. Nowadays, by analysing the sentinel node and by omitting the excision of the axillary lymph nodes for stage 4 of the disease, the number of axillary lymph node excisions decreased, but not significantly. The great number of axillary lymph node excisions brings along early and late complications of this technique. (4)

The axillary system of the mammary gland comprises lymphatic capillaries, lymphatic vessels and lymphatic nodes. There are no lymphatic capillaries within the muscles. The lymphatic vessels carry the lymph from the capillaries to the veins and are between 100 and 600 microns in diameter. There are multiple bicuspid valves along the lymphatic vessels, which narrow them, hence their irregular aspect. Each lymph node receives multiple vessels. There are more incoming vessels than outgoing ones, which are, instead, larger. The lymph nodes, true filters, have an important role in the defence of the organism, acting by phagocytosis and antibodies production. There are 400 – 700 lymph nodes in the human body, being more densely distributed in the armpit, where they may contain malignant neoplastic cells. On a lymphography these lymph nodes do not have a homogenous filling and their border appears irregular. In 30% of cases these lymph nodes have micrometastases, which don't have a visual expression, being visible only by the microscopic study of the specimen. That's why lymphography is not used in the staging of breast cancer, but the ablation of such nodes is imperative and is universally accepted.

The early and late complications which appeared after the excision of the axillary lymph nodes are:

1. Prolonged axillary drainage
2. Axillopectoral hematomas
3. Axillary collections (lymphocel, seroma)
4. Postoperative axillary lymphorrhagia and hemorrhages
5. Postoperative wound infection and local cellulitis
6. Dehiscence of the postoperative wounds
7. Delayed oncologic treatment
8. Axillary vein thrombosis
9. Delayed attachment of the skin to the thoracic wall
10. Late complications: local relapse of the tumor, thick arm, scapulo-humeral periarthritis, vicious or retractile scars etc. (6)

Many techniques were tried in the last decades, in the effort to prevent such complications. We will mention them although they did not reduce significantly the rate of complications:

1. Compressive bandages
2. Suturing and compressing the skin at the thoracic wall or intercostal muscles
3. Fixing the skin with tubes

Other techniques were tried with the purpose to fill the axillary space with the pectoral muscles: Chiricuta's himerisation procedure, which sutures the pectoralis major to

the pectoralis minor muscle sectioned at the thoracic insertion or simply the desinsertion of the pectoralis minor muscle from the thorax and filling the armpit with it, especially around the axillary vessels (Setlacec). The best results were obtained with active aspirative axillary drainages. But not even this technique reduced the number of complications and it proved to be inferior to axillopexy. (7)

Material and Method

Surgical technique

The two groups of patients analysed were admitted to the General Surgery Department of the Emergency Clinical County Hospital Constanța between 2007 and 2010 and to Mangalia Municipal Hospital in 2013. The patients included in this study had breast cancer in stages 2 and 3 and we performed Madden radical mastectomy or quadrantectomy with axillary lymph node dissection. The cases with limited resection had tumors in the external quadrants of the breast.

The analysis encompasses 59 cases distributed in two groups: group A in which axillopexy was performed (29 cases) and group B in which axillopexy was not performed (30 cases).

1. The operative technique consisted in Madden modified radical mastectomy with preservation of the pectoralis major and minor muscles or quadrantectomy with axillary lymph node dissection. (8,9)
2. Large dissection of the anterior surface of the pectoralis major muscle.
3. Preparation of the external margin of the pectoralis major muscle.
4. Preparation of the retropectoral space by dividing some conjunctive fibres at the level of the pectoralis major muscle tendon and some vascular and nervous elements which are treated by electrocoagulation or ligation, thus freeing the insertion tendon of the pectoralis major muscle.
5. Preparation of the vasculo-nervous pedicle of the pectoralis major muscle, resembling with a sector of a circle, which is divided. This way the mobility of the pectoralis major muscle increases after sectioning the arterial branches from the supreme thoracic artery, branches from the axillary artery and from the acromiothoracic trunk.
6. Dissection of the latissimus dorsi muscle margin up to the axillary vein at the superior extremity.
7. Dissection on the external and internal surface of the latissimus dorsi muscle along 2 or 3 cm.
8. In the inferior part between the latissimus dorsi muscle, the subscapular muscle and thoracic wall, extremely tidy hemostasis should be done because this space will be closed and can harbor hematomas. (*Fig. 2*)
9. Axillopexy represents the suturing of the pectoralis major muscle margin to the latissimus dorsi muscle margin starting from the highest point and finishing at the point where the muscles cannot be approximated because of the tension. From now on the axillopexy can be completed by suturing the pectoralis major and the latissimus dorsi muscle at the thoracic wall muscles. This is optional. (*Fig. 3*)
10. The drains may be thin and they are placed one behind the axillopexy and one in front of it. (*Fig. 4*)

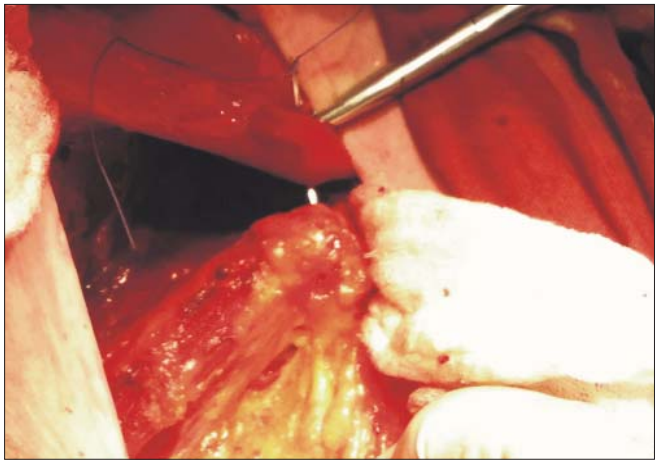


Figure 2. *The suture of the pectoralis major margin to the margin of the latissimus dorsi by sutures*

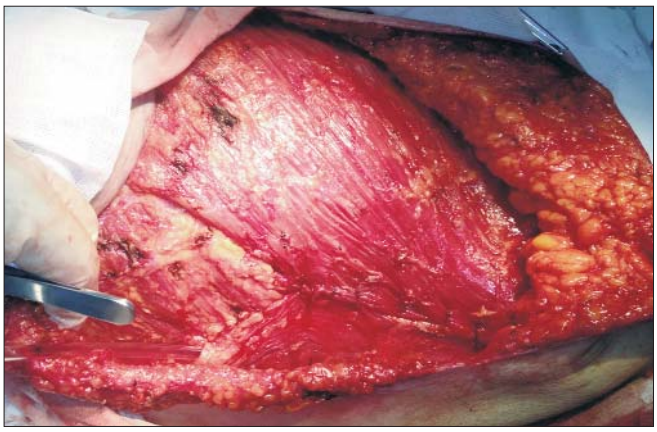


Figure 3. *The pectoralis major sutured to the latissimus dorsi and the posterior drain*

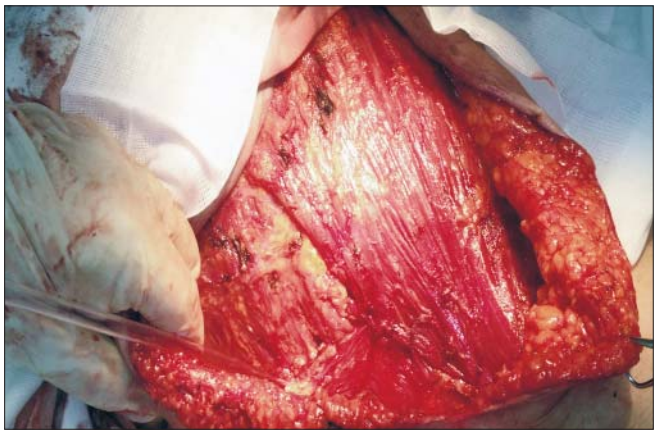


Figure 4. *Drainadge of axilla*

Table 1. *Results of the study*

	Group A (axillopexy)	Group B (no axillopexy)
No. of cases	29	30
Serosanguinolent secretion on drain	2 days	2 days
Pink, serous secretion (< 50 ml/24 hours)	5 days	7 – 9 days
Axillary lymph collections	1 case	17 cases
Average period of drainage	6 days	9 days
Postoperative lymphorrhagia	7 days	11 days
Prolonged axillary drainage(> 21 days)	1 case	5 cases
Axillopectoral hematomas	1 case	4 cases
Suppuration from wound and cellulitis	0	3 cases
Late skin closure	2 cases	7 cases
Average skin surface detached	75 cm^2 (limits 67,5 cm^2 - 90 cm^2)	75 cm^2 (limits 67,5 cm^2 - 90 cm^2)
Average period until initiation of postoperative oncologic treatment	27 days	34 days

Results

I. Description of the cases

- In 41 out of the 59 cases analysed the disease was discovered by the patients by auto-palpation.
- In 5 cases axillary lymph nodes which had small dimensions, were not detected by palpation, due also to obesity.
- There were 19 cases with grade 2 and 3 obesity.
- 32 cases had left breast cancer and 27 had right breast cancer.
- 37 cases had invasive carcinoma.
- In 7 cases conservative procedures were done.
- In 17 cases chemotherapy was performed preoperatively (stage 3).
- In 31 cases a thoraco-abdominal CT scan was performed, none of the patients having remote metastasis.

II. Group A (with axilopexy) versus Group B (without axilopexy) results are presented in Table 1

Conclusions

The analysis of the mentioned aspects shows that the axillopexy ameliorates the local evolution and accelerates the healing by reducing: the time of maintaining the drains, the frequency of postoperative collections, the frequency of local infectious complications, thus allowing earlier administration of the postoperative oncologic treatment. At last, but not at least, we must note the favorable effect that this procedure has on the hospitalization costs and the early social and professional reinsertion of the patients.

It is a facile procedure, which doesn't prolong the operation significantly and, practically, has no adverse effects.

The present work, the result of my personal experience, was elaborated as a statement for the constant use of axillopexy after axillary lymph node excision, the multiple arguments being easily obvious from the presented study.

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