Symposium On Postmastectomy Lymphedema Of The Arm

Brock E. Brush
Thomas Geoghegan
Melvin A. Block
Joseph L. Fleming
James R. Gish

See next page for additional authors

Follow this and additional works at: https://scholarlycommons.henryford.com/hfhmedjournal

Part of the Life Sciences Commons, Medical Specialties Commons, and the Public Health Commons

Recommended Citation


This Article is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons. For more information, please contact acabrer4@hfhs.org.
Symposium On Postmastectomy Lymphedema Of The Arm

Authors
Brock E. Brush, Thomas Geoghegan, Melvin A. Block, Joseph L. Fleming, James R. Gish, William R. Eyler, and Charles Long II
SYMPOSIUM ON POSTMASTECTOMY LYMPHEDEMA OF THE ARM

Introduction

BROCK E. BRUSH, M.D., MODERATOR*

We have selected for discussion this morning lymphedema of the arm following mastectomy. The occurrence of this troublesome complication causes distress and disability on the part of the patient and concern to the surgeon. Dr. Geoghegan will report some historical facts about this condition. Dr. Block will report the history and findings of the patients recently seen in the clinic. Since x-ray therapy has frequently been blamed for swelling of the arm, I have asked Dr. Eyler, Chief of the Department of Radiology, to present his views on this aspect of the subject.

We have this past year been using a device to give relief to patients with a large painful arm. It consists of (1) a sleeve, woven of special material in which two inflatable rubber tubes are incorporated (Fig. A), (2) a machine to produce inflation of the tubes for periods of 15 seconds each minute. We have used this apparatus on eleven patients and have been satisfied with the results. It is important that the device be used for 7-8 hours a day for the first few days of treatment. An elastic sleeve is worn between treatments.

Dr. Long of the Department of Physical Medicine is interested in this problem, especially in the field of prevention. Dr. Long will give us his views on this subject.

Figure A. Device for relief of lymphedema.
(Supplied by the JOBST Applied Biomechanics Institute — Toledo, Ohio.)

*Department of General Surgery
Postmastectomy Lymphedema of the Arm: Historical Review

THOMAS GEOGHEGAN, M. D.*

In his paper dealing with postmastectomy lymphedema Halsted1 recounted his first experience with edema of an area following extirpation of the lymph nodes draining it. A patient operated upon in 1882 sustained tremendous edema of the scrotum after excision of his inguinal nodes. Halsted was again faced with this complication when he began to perform the radical operation for cancer of the breast. In reviewing his difficulties with this complication, which he termed "elephantiasis chirurgica", he concluded that infection was an invariable factor in its production.

In spite of newer methods for combating bacteria the incidence of edema of the arm after mastectomy remains high. Sampson Handley2 in 1908 stated that "the brawny arm occurs in about one case of every six". In 1949 Lobb and Harkins3 placed the figure at 80 per cent in a carefully studied series of 81 patients. In 31 per cent the edema was less than 1.5 cm.; in 27 per cent between 1.6 and 2.9 cm. and in 22 per cent greater than 3.0 cm. These workers incriminated postoperative radiotherapy as a causal factor.

Aside from the factors of infection and radiotherapy, which most workers do not believe to be of primary importance, venous obstruction and lymphatic obstruction have been singled out for consideration. Veal4 demonstrated an increase in the venous pressure of the swollen arm together with venographic findings of partial or complete obstruction of the axillary and subclavian veins. The obstruction in most cases resulted from benign scar formation. Devenish and Jessop5, on the other hand, could find little in the way of venous pressure changes, but showed pathologic detours in the lymphatic drainage routes in lymphatic dye studies.

The multitude of therapeutic suggestions for this complication have been outlined by various authors. Foley6 has catalogued the conservative measures such as massage and the use of diuretics. Treves7 discusses the many surgical procedures which have been used such as the Kondoleon procedure and axillary vein resection.

Some of these points will be amplified by the discussion which follows.

*Lymphangiosarcoma Occurring in Postmastectomy Lymphedema

MELVIN A. BLOCK, M. D.* JOSEPH L. FLEMING, M. D.**

JAMES R. GISH, M. D.***

One of the rare complications of lymphedema of the arm following radical mastectomy is lymphangiosarcoma. This lesion was first described in 1948 by Stewart and Treves1 with a report of six cases. The authors noted that the condition had usually been considered to be Kaposi's sarcoma or cutaneous metastases of breast carcinoma previously. At least sixteen cases of this malignancy have now been reported, according to Marshall8.

Lymphangiosarcoma in postmastectomy lymphedema occurs usually in arms that became edematous early in the post-operative period, although in the one patient with
this condition that we have seen the edema was not noticed until six years following surgery. The malignancy appears late post-operatively, six to twenty-four years later in reported instances. There has been no relation between occurrence of the lesion and the presence of metastases from mammary carcinoma in axillary lymph nodes. There is no relation either between occurrence of the lesion and the administration or lack of administration of radiation therapy for the breast carcinoma.

The appearance of the lesions of this malignancy are quite characteristic. They appear as purplish-red, subdermal, slightly raised lesions usually occurring in the arm. Satellite lesions appear and all may become confluent and become large lesions. Later the overlying skin ulcerates and serous or serosanguinous fluid along with necrotic malignant tissue may discharge. Thus, there is no good resemblance between this malignancy and recurrent mammary carcinoma. Lymphangiosarcoma occurring in postmastectomy lymphedema does not occur initially in the axilla and can be distinguished from malignant lymphangioma occurring in the axilla following radiation therapy to the axilla after radical mastectomy. Lymphangiosarcoma lesions enlarge and metastasize to the skin of the upper extremity, shoulder, chest and to the lungs.

Microscopic studies of biopsies may be misleading and the lesions may be reported as lymphangiectasis and benign inflammatory conditions. However, the diagnosis can nearly always be made from the history and gross appearance of the condition.

Treatment in general has been unsatisfactory. Radiation therapy and forequarter amputation individually or in combination have been used and yet the outcome has been fatal in nearly all cases. Rawson and Frank did report a case in which a good response was obtained from radiation.

We have observed the occurrence of lymphangiosarcoma in post-mastectomy lymphedema in one patient. In this patient lymphedema was noted about six years postoperatively with the lymphangiosarcoma appearing eight years postoperatively. Forequarter amputation combined with radiation therapy was advised and this was carried out elsewhere.

Why lymphangiosarcoma occurs in chronic lymphedema of the arm is an interesting problem but entirely speculative.

*Department of General Surgery
**Department of Orthopedics
***Department of Radiation Therapy

Postmastectomy Edema of the Arm: Roentgen Aspects

JAMES R. GISH, M.D.*
WILLIAM R. EYLER, M.D.**

This problem is encountered quite frequently in the patients seen in radiotherapy, usually it is difficult to determine the main factor that is causing the edema of the arm. There are at least four possible causes for this condition:

1. Radical surgery with disruption of the normal circulatory channels.
2. Radiation therapy with resultant delayed formation of lymphatic channels, scar formation, and slow healing.
3. Infection and/or fat necrosis in the operative wound with marked delay of formation of lymphatic channels.

4. Axillary metastatic disease with occlusion by pressure or invasion of the normal circulatory channels.

The patients usually have had radical surgery and appear to be well healed without infection, but underlying fat necrosis may be present, and certainly the majority have metastatic axillary disease. Only rarely does this condition develop in the arm when radiation therapy alone is used. It is more common for this condition to be aggravated while under treatment or immediately thereafter than to see it initiated during this same period. Some patients with far advanced cancer of the breast and obvious axillary metastases who have had no previous treatment of any kind show marked edema. However, many such patients show no edema.

The literature on this subject cites various conclusions regarding the relative importance of the major factors causing postmastectomy edema of the arm. Reichert working with Halsted in the early twenties showed in animal experimentation that no significant edema occurred in the extremities of dogs when the soft parts with the exception of the artery, vein, and nerve were severed, provided that there was no infection in the wound. Veal in 1937 concluded that occlusion of the axillary vein played a most significant part in causing edema of the arm. Holman, McSwain, and Beal in 1944 after analysis of a hundred cases thought that infection and radiation therapy were the two most significant factors producing edema of the arm.

MacDonald decided that resection of the axillary vein enabled him to perform a more thorough dissection of the axilla and also seemed to lower the incidence of postoperative edema, a direct contradiction of the opinion stated above. Deaton and Bradshaw in a study of twenty-four cases concluded that the only common denominator in their cases of postmastectomy edema was infection in the operative wound.

In conclusion, there are at least four major contributing causes of this condition. Separating them in regard to their importance in a given case is quite difficult and sometimes impossible. In our experience, radiation therapy very infrequently initiates this condition, but occasionally does aggravate it. The timing of the appearance of the edema and the administration of the radiation therapy is the principal evidence supporting this opinion. Radiation therapy has little to offer in the treatment of this condition, except when caused by metastatic axillary disease alone.

* Department of Radiology
**Radiologist-in-Chief, Department of Radiology

Physical Factors in Post-mastectomy Lymphedema

CHARLES LONG II, M. D.*

The major factors in the production of lymphedema in the post-radical mastectomy arm are failure of muscular pump and anatomic disruption of lymph drainage channels. The failure of the muscular pump action of the extremity takes place in three stages. First the arm is necessarily immobilized in the immediate post-operative period. During
this stage normal muscular action of the arm, particularly the shoulder girdle musculature, is prohibited. The second stage, disuse atrophy, occurs if immobilization is continued beyond a few days. In the final stage the patient may develop a frozen or partially limited shoulder, further inhibiting the use of the extremity and contributing further to the trend of disuse and hence failure of the muscular pump.

Actual interruption of lymph drainage channels through the axilla is probably the major cause of the lymphedema; however, cases can be cited in which the lymph vessels and nodes were relatively spared and yet lymphedema developed. Apparently both disuse and channel interruption factors are operative in most cases.

Physical treatment, prophylactic or definitive, is aimed at minimizing the effect of the two etiologic factors. Active motion of the shoulder should be initiated as soon as feasible post-operatively, certainly by the time the sutures are removed; partial range can often be prescribed safely a few days after operation, though full range exercises may have to be delayed.

The patient should be instructed during the further recovery period to exercise the arm with increasing frequency and increasing resistance, even with the use of some household articles (such as a flatiron) for weights. It has been shown that muscular activity is an efficient method of moving lymph from an extremity. This advantage is partially cancelled by the damming-up which may occur behind partially interrupted outflow channels.

The lymphatic blockage itself must be treated by methods designed to build up pressure in the lymphedematous extremity to the point where lymph is forced through the obstruction, dilating existing channels and perhaps forming collaterals. This can be done partially by active exercise, though this has the disadvantage of producing more lymph as it is forcing out existing amounts. Therefore, massage methods are often added in the treatment of the arm which is already lymphedematous. Massage can be taught to a member of the patient’s family for home administration, or the patient may come to the physical therapist for treatment; in either case massage should be deep, should move from distal to proximal, and should be given daily.

Although there are discouraging reports in the literature concerning the use of mechanical constricting devices for the relief of edema, I have recently seen one particularly encouraging case in which the Brush machine was used. This machine apparently builds up very high pressures and is kept on for long periods, possibly explaining the difference in results obtained here and elsewhere; further use and investigation with this device is indicated.

*Physician-in-Charge, Division of Physical Medicine and Rehabilitation

REFERENCES

Geoghegan, T.: Postmastectomy lymphedema of the arm. Historical Review

Block, M. A., Fleming, J. L. and Gish, J. R.: Lymphangiosarcoma occurring in postmastectomy lymphedema.

Eyler, W. R., and Gish, J. R.: Postmastectomy edema of the arm. Roentgen Aspects