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Arm lymphoedema after surgical treatment for the cancer of the breast

Obrzęk chłonny kończyny górnej po chirurgicznym leczeniu raka piersi

Approximately 10,000 of new cases of breast cancer are diagnosed in women in Poland every year (15). The majority of the patients receive a form of surgical treatment of the breast and undergo obligatory axillary node dissection. Determining the number of positive lymph nodes is a very important prognostic factor which informs about the possibility of complete cure or the probability of recurrent disease (3). In clinical practice the status of axillary lymph nodes is used to make a decision about the use of chemotherapy or hormonotherapy (11). Attempts to determine molecular indicators to inform about the status of the axillary lymph nodes in order to avoid lymph node dissection have been unsuccessful (13). The most promising is the method discovered by Giuliano in 1994, which consists in the dissection of the sentinel node whose hystopathological status is used to make a decision about further treatment (5). Axillary lymph node dissection causes complications of various severity which interfere with patients' daily activities, and the most serious of these complications is arm lymphoedema on the side of the surgery (6).

Arm lymphoedema is a complication of surgical treatment and, in some cases, of subsequent radiotherapy, it has the incidence of 7% - 62%, and develops soon after surgery or during the follow-up period. Early lymphodema which occurs shortly after surgery, is caused by excessive filling of lymph vessels, and is self-limited as a rule (2). Late lymphoedema occurs approximately 6 months after surgery mainly as a result of the obliteration of axillary lymph vessels (10). Patients who had undergone surgery according to Halsted's method (mastectomy including the removal of the pectoral muscles and full dissection of axillary lymph nodes) demonstrated the incidence of arm lymphoedema on

the side of the surgery of over 62% (9). It has been observed, however, that less extensive surgery in breast cancer treatment results in a lower incidence of troublesome lymphoedema. A number of clinical studies on this problem were conducted, however they adopted different approaches to postoperative rehabilitation. In some centres rehabilitation is started on the second day after surgery, in others it does not begin before the postoperative wound is healed up and lymphorrhoea stops. The incidence of lymphoedema does not only depend on the type of rehabilitation, but also on the surgical technique (7).

The aim of this study was to determine the incidence of the complications of axillary node dissection as a part of breast cancer treatment in our patients.

MATERIAL AND METHOD

84 patients who had undergone radical mastectomy as a treatment for Stage I and II breast carcinoma in the Oncology Centre of the Lublin Region in 1999, were identified for this study. The patients were aged 34-68 years, the median age was 54 years. The survey was carried out at 6 months after surgery, and its questions addressed the following: shoulder mobility range, muscle power, lymphoedema of the arm and metacarpus. The results are demonstrated in Table 1. The efficiency of the arm on the side of the surgery was evaluated by means of the test by Kułakowski-Mika, excluding the point evaluation system since the results had to be compared with the results of other studies (11).

RESULTS

It was found that shoulder range on the side of the surgery remained almost unchanged. Abduction was 110° - 180°, the median value was 178°. External rotation varied from 60° to 90°, the median value was 86°. Horizontal extension was 110° – 120°, the median value was 119°. Muscle power measured by hand squeeze was 16.3kg – 29.9kg, the median value was 22.3kg. Lymphoedema which was evaluated by the comparison of the circumference measured 10cm above the lateral epicondylus of the humeral bone on the side of the surgery with the circumference of the other arm, varied 0–3 cm. The differences between arm circumferences of 0–1cm were assumed to be the tolerance for natural physiological differences. 19% of the patients had lymphoedema of 1-2cm, and 8% had 2-3cm. Lymphoedema measured at the metacarpus varied in volume (1-3cm) was found in 16% of the patients.

Table 1. The evaluation of arm efficiency on the side of axillary node dissection as a part of breast cancer treatment

Criteria	Type of tests	Results	Median values in %
Shoulder mobility range	Abduction	110°-180°	178°
	External rotation	60°-90°	86°
	Horizontal extension	110°-120°	119°
Muscle power	Hand squeeze	16.3-29.9kg	22.3kg
Lymphoedema	Difference between the circumferences of both arms measured at 10 cm above lateral epicondylus of humeral bone		
	0-1cm	61 patients	73%
	1-2cm	16 patients	19%
	2-3cm	7 patients	8%
	in the middle of metacarpus		
	1-3cm	13 patients	16%

DISCUSSION

The evaluation of lymphoedema may be difficult due to subjective feelings of patients which may noticeably differ from the objective measurements of arm circumference or volume. Determining the percentage of incidence of arm lymphoedema enables both to monitor the quality of rehabilitation and induces further search for new methods of treatment that would result in fewer complications of that kind. The study conducted by Aitken was aimed at the evaluation of the effects of mastectomy with the sentinel node biopsy and selective radiotherapy, and mastectomy with full dissection of axillary lymph nodes. No objective differences were found in the incidence of lymphoedma, however, the patients with positive nodes reported oedema more frequently (7,1). Another reasonably large study of 200 patients who had received various treatment for breast cancer, included measuring arm circumference and volume. This study revealed that the most important factor is the treatment of the axilla. The

methods of surgical treatment of the breast, their possible complications, patient's age, or tumour size were not associated with the development of late oedema. Sentinel node biopsy, radiotherapy of the axilla without preceding surgery, sentinel node biopsy followed by radiotherapy, or full axillary node dissection all demonstrated similar incidence of oedema which was approximately 7-9%. However, the combination of full dissection of axillary lymph nodes with radiotherapy results in a considerable increase in the incidence of lymphoedema up to 38% (4). The incidence of lymphoedema of various severity observed in our centre was 27%, which is similar to the values reported by other researchers (2,9,14). The higher incidence of lymphoedema may be associated with the dissection of all the three levels of nodes in the axilla, while some oncology centres prefer to carry out the dissection of only levels I and II of nodes. Such procedure is based on the practical approach to the presence of metastases in the lymph nodes; namely the incidence of metastases on level III while levels I and II remain negative, is below 1%. The lack of final solution to the problem of the improvement of cure by means of the full axillary node dissection method has led to such differences in the surgery of axillary lymph nodes in the treatment of breast cancer (2,9,4,14,12).

CONCLUSIONS

Arm lymphoedema on the side of the axillary node dissection in the treatment of breast cancer is the most serious complication, and is reported in all breast cancer publications. The incidence of arm lymphoedema is varied and is mainly associated with the extent of the dissection. It may be possible to lower the incidence of arm lymphoedema in the near future due to the introduction of the method examining the status of the sentinel node for the presence of metastases. The results of such examination will be used to decide about the necessity and extent of dissection in the axilla. This method invented by Giuliano is already being introduced into clinical practice, and will enable to lower the incidence of arm lymphoedema in patients with negative axillary lymph nodes.

REFERENCES

1. Aitken R.J. et al.: Arm morbidity within a trial of mastectomy and either nodal sampling and selective radiotherapy or axillary clearence. Br. J Surg., 76, 568, 1989.
2. Browse N.L. et al.: Lymphoedema: pathophysiology and classification. J Cardiovasc. Surg., 26, 91, 1985.
3. Carter C.L. et al.: Relation of tumor size lymph node status and survival in 24 740 breast cancer cases. Cancer, 63, 181, 1989.
4. Falk S.J.: Radiotherapy and the management of the axilla in early breast cancer. Br. J. Surg., 81, 1277, 1994.
5. Giuliano A.E. et al.: Lymphatic mapping and sentinel lymphadenectomy for breast cancer. Ann. Surg., 220, 398, 1994.
6. Hafty B.G. et al.: Reappraisal of the role of axillary lymph node dissection in the conservative treatment of breast cancer. J. Clin. Oncol., 15, 691, 1997.
7. Kilkenny J.W.: Addressing the axilla in breast cancer. Ann. Surg. Oncol., 5, 299, 1998.
8. Kułakowski A. et al.: Kryteria ustalania sprawności kończyny górnej po mastektomii i radioterapii z powodu raka sutka. Pol. Tyg. Lek., 34, 1241, 1979.
9. Lobb A.W. et al.: Postmastectomy swelling of the arm with note on effect of segmental resection of the axillary vein at time of radical mastectomy. West J. Surg., 57, 550, 1949.
10. Mozes M. et al.: The role of infection in post-mastectomy lymphoedema. Surg. Ann., 14, 73, 1982.
11. Osborne C.K. et al.: Adjuvant systemic therapy of primary breast cancer. [In:] Harris J.R., Lippman M.E., Morrow M., Hellman S., (ed.). Diseases of the Breast. Philadelphia: J.B. Lippincott 548, 1996.
12. Roderick R. Turner M.D, David W. et al.: Histopathologic validation of the sentinel lymph node hypothesis for breast carcinoma 226, 271, 1997.
13. Silverstein M.J., Gierson E.D., Waisman J.R. et al.: Prediction axillary node positivity in patients with invasive carcinoma of the breast by using a combination of T category and palpability. J. Am. Coll. Surg. 180,700, 1995.
14. Warmuth M.A., et al.: Complications of axillary lymph node dissection for carcinoma of the breast. Cancer 83, 1362, 1998.
15. Zatoński W. A.: Nowotwory złośliwe w Polsce. Wiedza i Życie, Instytut Onkologii Warszawa, 1993.

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STRESZCZENIE

Przeprowadzono badania u 84 chorych leczonych radykalnym odjęciem piersi w celu określenia częstości powikłań związanych z usunięciem węzłów chłonnych jamy pachowej. Stwierdzono, że najczęstszym powikłaniem jest obrzęk kończyny górnej, który wystąpił z różnym nasileniem u 27% operowanych kobiet. Ograniczenia ruchomości były niewielkie i nie miały wpływu na jakość życia.