Retrospective Analysis of Pectoralis Major Myocutaneous Flap Surgeries Performed under War Conditions

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Aim. To present our experiences in using a pectoralis major myocutaneous flap in the reconstruction of surgically created defects of the neck and lower part of the head during the war in Bosnia and Herzegovina.

Methods. Retrospective analysis of medical records from 15 patients treated at the ENT Department, Tuzla University Hospital, between January 1992 and December 1996.

Results. Ten flaps were prepared during basic operation (“one step reconstruction of defect”) and five flaps three weeks after the removal of tumor (postoperative pharyngocutaneous fistula was the reason for secondary flap preparation). The necessary time for flap preparation and its accommodation in the defect was 2 hours. The most frequent complications included seroma of donor site (6/13), fistula (3/13), partial necrosis of the flap (2/13), and total necrosis of the flap (2/13). Three patients died in the postoperative period because of a cardiac arrest but the flaps accepted correctly.

Conclusion. The pectoralis major myocutaneous flap is a good solution for covering defects of the neck and lower region of the head. Military blockade with extremely difficult conditions and lack of experience were the reason of the higher complication rate than those from literature.

Keywords: pectoralis major myocutaneous flap; reconstructive surgery; head and neck; war conditions

The pectoralis major myocutaneous flap was described by Hueston and McConhie in 1968 (1), to resurface anterior chest wall defects. Its use was first mentioned by Arriyan (2) in head and neck reconstruction. The uses of this flap include: resurfacing of the face and neck, reconstruction of the oral cavity, nasopharynx and hypopharynx, and mandibular reconstruction as an osseomyocutaneous flap.

We started using this type of flap during the war in Bosnia and Herzegovina and our initial experiences with the pectoralis major myocutaneous flap are shown in this paper. Before the war, patients needing this type of surgery were sent abroad, but due to absolute military blockade in which any kind of transport of our patients was impossible, we decided to perform plastic reconstructive operation ourselves. The work in this period was performed under extremely difficult conditions, such as shortage of potable water and electricity, continuous inflow of a large number of wounded, and a limited number of qualified medical personnel (3).

Patients and Methods

This retrospective analysis was performed on medical records of 15 patients with carcinoma of neck or lower part of head subjected to cervical reconstruction with pectoralis musculocutaneous flaps. The patients did treated at the ENT Department, Tuzla University Hospital, in the period from January 1992 to December 1996. We used this method only for the reconstruction of surgically created defects.

All patients were civilians, 13 men and 2 women. The age of the patient varied from 43 to 74 years with a mean of 65.2 ±5.0 year. The patient did not receive any preoperative treatment, such as radiotherapy.

Flaps were prepared during the primary operation of the tumor or in another surgery after the removal of the tumor. All surgically created defects were closed circumferentially.

Two vacuum drains were inserted separately to evacuate secretions. Prophylactic antibiotic therapy was applied (intravenous double antibiotic therapy: crystal penicillin 2.0 MU units six-time daily and gentamycin 80 mg three times daily).

Results

The basic disease was laryngeal carcinoma in thirteen patients, carcinoma of the auricle in one patient, and carcinoma of the mandible with concomitant bone defect in one patient. Histopathologically, all tumors were squamous cell carcinomas. According to TNM classification, 3 patients had T3N0M0, 1 had T3N1M0, 3 had T4,N0,M0, 4 had T4,N1M0, 1 had T4,N2,M0, and 3 had T4,N2bM0.

Ten flaps were prepared during the basic operation (“one step reconstruction of defect”). Five flaps were prepared three weeks after the removal of the tumor.
(postoperative pharyngocutaneous fistula, as a complication of total laryngectomy was the reason for secondary flap preparation).

The necessary time for flap preparation and for its accommodation in the defect was 2 hours. The average time of hospitalization was 38.2 days (range 12-116), including the time of surgical treatment of the basic disorder.

Due to war conditions, we did not endoscopically or radiologically check the results of the surgery. Clinically, the results were satisfying, patients had no difficulties in swallowing, cosmetic function was satisfactory, such as the function of the arm on side of the created flap. In the follow up of the patients we did not observe dermal metastasis at the donor site.

The most frequent complication was minor complications included seroma of the donor site in 6 patients. Major complications included fistula, partial necrosis of the flap and total necrosis of the flap (Table 1). Total necrosis of the flap required taking another flaps from the other side of the chest.

Three patients died in the postoperative period because of a cardiac arrest but the flaps accepted correctly.

### Table 1. Complications of the pectoralis major myocutaneous flap in 13 patients treated under war conditions

<table>
<thead>
<tr>
<th>Complication</th>
<th>Number of Patients</th>
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<tbody>
<tr>
<td>Major complications:</td>
<td></td>
</tr>
<tr>
<td>Total necrosis of flap</td>
<td>2</td>
</tr>
<tr>
<td>Partial necrosis of flap</td>
<td>2</td>
</tr>
<tr>
<td>Fistula</td>
<td>3</td>
</tr>
<tr>
<td>Minor complications:</td>
<td></td>
</tr>
<tr>
<td>Seroma of donor site</td>
<td>6</td>
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Discussion

The pectoralis major myocutaneous flap provides a safe, reliable method for immediate reconstruction of surgically created or traumatic defects on the head, neck, and upper trunk (4,5). A surgeon can achieve anatomical and functional rehabilitation in a one-step procedure in most cases, even after extended resection for neck and head cancer.

Under war conditions we decided to start with this plastic reconstructive operations only on surgically created defects. We did not find data in literature about the use of this flap during war conditions.

The main complication of this type of flap is a partial flap necrosis when the pedicle becomes twisted or when there is concomitant ischemia because of underlying small vessel disease (diabetes, generalized atherosclerosis, or radiotherapy). There are other complications like dermal metastases of the donor site from laryngeal squamous cell carcinoma (6). Some authors observed total complication rates about 58% (7). Others observed higher complication rates among women than men (8).

The total complication rate in our study was 86.6% and was higher than those from the literature (7). Seroma of donor site was the most frequent minor complication, due to large mobilization of tissue, although vacuum drains were used. Total necrosis of the flap in two cases required taking another flaps from the other side of the chest. Partial necrosis was treated by necrectomy with a subsequent procedure to cover created defect. Large number of complications can be explained by the lack of experience in this procedure and war conditions (3).

One should be aware of the fact that the technique of the pectoralis major myocutaneous flap does not offer an improvement of prognosis. But its use from a functional and cosmetic standpoint is an integral and important part of treatment, even under such extreme war conditions.

### References