

Pectoralis major myocutaneous flap in Head And Neck Surgery reconstructions: critical analysis.

O retalho do músculo peitoral maior nas reconstruções em Cirurgia de Cabeça e Pescoço: análise crítica

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A B S T R A C T

Objective: to evaluate the results of the use of the pectoralis major flap in the reconstruction of head and neck surgeries. **Methods:** we conducted a retrospective study with data bank analysis and review of medical records of patients with head and neck cancer operated at the Discipline of Head and Neck Surgery, Surgery Department, São Paulo Holy Home of Mercy, using the pectoralis major flap for reconstruction, in a period of 16 years. We analyzed age, gender, primary site of neoplasia, clinical staging, preoperative radiotherapy (RT) and complications, classified as major and minor. **Results:** the series comprised 92 patients, of whom 86 (93.5%) were men; the mean age was 61.39 (± 11.35) years; the most common primary sites were the mouth, in 35 cases (38%), oropharynx, in 21 (22.8%), and larynx, in 18 cases (19.6%). The majority of patients were in stage IV (88/92, 95.6%) and only four (4.3%) had preoperative RT. The overall complication rate was 48.9%, but only 6.5%, characterized as major complications. In the univariate statistical analysis, we found no factors related to the occurrence of complications. Only the primary neoplasm site presented marginal significance ($p = 0.06$). **Conclusion:** the pectoralis major flap is safe, with few complete and effective losses in reconstructions in head and neck surgeries, with low rates of major complications, being an option to be considered.

Keywords: Head and Neck Neoplasms. Myocutaneous Flap. Pectoralis Muscles. Postoperative Complications.

INTRODUCTION

Until the 1940s, reconstructions in head and neck surgeries (HNS) were limited by, and associated with, significant rates of complications. In the 1970s, these reconstructions underwent an expressive change due to the description of the pectoralis major muscle myocutaneous flap (PMF), a procedure described by Ariyan¹. After the description of this flap, reconstruction in HNS reached a higher level, with improvement of aesthetic and functional results. Even after the advent of the microsurgical flap, PMF is still an important and strategic flap, especially in services where there are limitations to the execution of the microsurgical flap or when there are restrictions to its use, such as in the absence of receptor vessels or in the presence

of severe comorbidities². PMF has an excellent rotational arch, neurovascular pedicle, and axial blood supply, adequate aesthetic results, with a good amount of tissue for reconstruction, especially when there is a need for coverage of important cervical structures, such as the carotid artery, especially in patients submitted to previous radiotherapy. Among the limitations and problems of its use, there is the restriction in some sites due to its arc of rotation, possible difference in color between the skin flap reconstruction site when used after resection of extensive skin tumors, breasts asymmetry as a sequela in females and functional limitation of adduction and/or rotation of the arm^{3,4}. Given its importance, this study aims to evaluate the complications of the PMF use in reconstructions in head and neck surgery.

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METHODS

This is a retrospective observational study with data bank analysis and review of medical records of cases of head and neck cancer operated in the Discipline of Head and Neck Surgery of the Surgery Department of the São Paulo Holy Home of Mercy, from January 2001 to December of 2016, with PMF used for reconstruction. We excluded patients whose records had incomplete information. We analyzed the following variables: age, gender, primary site of malignant neoplasms (mouth, oropharynx, larynx, hypopharynx, skin and salivary glands), clinical staging according to AJCC (7th Edition)⁵ and preoperative radiotherapy, correlating them with complications, which were subdivided into major and minor complications. Among the major complications were necrosis and complete loss of the flap, requiring a new surgical intervention for correction, and among the minor ones, self-limited fistulas, partial self-limited dehiscence and partial necrosis, without the need for surgical intervention.

For univariate statistical analysis, we used the

Epi Info version 7.2 software, with a significance level of 5%.

This work was approved by the Irmandade da Santa Casa de Misericórdia de São Paulo Ethics Committee, under the number 03297312800005258.

RESULTS

The study sample consisted of 92 patients, of whom 86 (93.5%) were men, the mean age being 61.39 (± 11.35) years. As for complications (Table 1), these occurred in 45 cases (48.9%), of which only six (6.5%) were major ones. Among the malignant neoplasm sites (Table 2), mouth (38%), oropharynx (22.8%) and larynx (19.6%) were the most affected, with 35, 21 and 18 patients, respectively, displaying a marginal level of statistical significance in relation to the occurrence of complications ($p=0.062$). As for the tumors' clinical stage, 88 (95.6%) were stage IV, and preoperative radiotherapy was performed in four patients (4.3%); both variables showed no correlation with the occurrence of complications ($p=0.48$ and $p=0.17$, respectively).

Table 1. Distribution of major and minor complications.

Complication	N	% (n = 92)
No complication	47	51.1
Minor	39	42.4
Major	6	6.5
Total	92	100

Table 2. Distribution of major and minor complications according to primary sites.

Tumor Site	None Complications	Minor Complications	Major Complications	Total
Mouth	19 (54.29%)	14 (40%)	2 (5.71%)	35 (100%)
Oropharynx	14 (66.67%)	5 (23.81%)	2 (9.52%)	21 (100%)
Larynx	7 (38.89%)	9 (50%)	2 (11.11%)	18 (100%)
Hypopharynx	1 (14.29%)	6 (85.71%)	0	7 (100%)
Skin	3 (37.5%)	5 (62.5%)	0	8 (100%)
Other	3 (100%)	0	0	3 (100%)
Total	47 (51.09%)	39 (42.39%)	6 (6.52%)	92

DISCUSSION

Of the 92 patients submitted to reconstruction surgery using the pectoralis major flap, 45 (48.9%) had complications, a result similar to the findings of Pinto *et al.*⁶, in which the reported complication rate was 43.1%, half of them represented by major complications, relating the previous radiotherapy treatment to the worsening of results ($p=0.04$). McLean *et al.*⁷, studying 136 patients, reported only 18 cases with complications (13%). However, the authors did not evaluate tumor staging, which could explain the low rate of complications should the number of tumors in lower stages be higher. Still, of the 18 cases in which complications occurred, 13 had undergone radiotherapy, of which six had RT prior to the procedure. Thus, they considered RT as an important risk factor for the occurrence of complications. In our study, because of the small number of patients with RT prior to surgery (4.3%), we did not observe this association ($p=0.48$).

In Lima's work⁸, of the 116 patients evaluated, 73 presented complications (62.9%), and 31 (26%) of these were major ones. In the study by Tripathi *et al.*⁹, they reported a 40% complication rate, and 83% of the patients in the series had advanced stage disease, III and IV, without association of neoadjuvant treatment with the occurrence of complications. In our study, 95.6% (88/92) of the cases were stage IV tumors, which could explain the significant percentage of complications (48.9%). However, there was no statistically significant relation in our study ($p=0.17$).

When analyzing the tumor sites (Table 2), we observed that in the tumors of the larynx, hypo-

pharynx and skin, the occurrence of complications was high (61.11%, 85.71% and 62.5%, respectively) with a marginal level of significance ($p=0.062$). This can be explained by the need for radical surgery in advanced tumors of the larynx and hypopharynx, usually consisting of total pharyngolaryngectomy with reconstruction of the digestive tract in this segment, a complex procedure with a high possibility of complications, especially fistulas. In the case of advanced skin tumors, especially those of the face, when they compromise the external ear, mastoid, middle ear, among other structures of the skull base, where there is a need for extensive surgical resection and reconstruction, the occurrence of infection is significant, with possibility of dehiscence and partial loss of the flap. In addition, PMF has a weight that in these regions may be associated with dehiscence of the highest portion of the reconstructed area. Thus, in head and neck surgeries, PMF is generally used for reconstruction after extensive resections, since the flap presents a large volume (thickness), besides allowing a large diameter skin island, being little used to reconstruct small defects. Therefore, in most cases, patients have advanced clinical status, which could influence the evolution and postoperative complications.

Although the percentage of complications found was 48.9%, major complications were not common (6.5%), showing that Pectoralis Major Myocutaneous Flap is a viable and safe option for Head and Neck Surgery reconstruction, especially in places where the microsurgical flap is not possible due to cost and infrastructure, or in patients with clinical contraindications for this type of reconstruction.

R E S U M O

Objetivo: avaliar os resultados do uso do retalho de músculo peitoral maior nas reconstruções de cirurgias de cabeça e pescoço. **Método:** estudo retrospectivo com análise de banco dados e revisão de prontuários de pacientes com câncer de cabeça e pescoço operados na Disciplina de Cirurgia de Cabeça e Pescoço do Departamento de Cirurgia da Santa Casa de São Paulo em um período de 16 anos, utilizando-se o retalho de músculo peitoral maior para reconstrução. Foram analisados idade, sexo, sítio primário da neoplasia, estadiamento clínico, radioterapia (RT) pré-operatória e as complicações encontradas, classificadas em maiores e menores. **Resultados:** a casuística foi de 92 pacientes, dos quais 86 (93,5%) eram homens; a média de idade foi de 61,39 ($dp\pm 11,35$) anos; os sítios primários mais acometidos foram boca em 35 casos (38%); orofaringe em 21 casos (22,8%) e laringe em 18 casos (19,6%). A maioria dos pacientes encontrava-se no estágio IV (88/92; 95,6%) e apenas quatro (4,3%) tinham realizado a RT pré-operatória. A taxa global de complicações foi de 48,9%, mas apenas 6,5% caracterizadas como complicações maiores. Na análise estatística univariada, não foram encontrados fatores relacionados à ocorrência das complicações. Apenas o sítio primário da neoplasia apresentou significância marginal ($p=0,06$). **Conclusão:** o retalho de músculo peitoral maior é seguro, com poucas perdas completas e eficaz nas reconstruções em cirurgias de cabeça e pescoço, com baixas taxas de complicações maiores, sendo uma opção a ser considerada.

Descritores: Neoplasias de Cabeça e Pescoço. Retalho Miocutâneo. Músculos Peitorais. Complicações Pós-Operatórias.

REFERENCES

1. Ariyan S. The pectoralis major myocutaneous flap. A versatile flap for reconstruction in the head and neck. *Plast Reconstr Surg.* 1979;63(1):73-81.
2. Bhanja A, D'Souza DS, Roy C, Poddar RN. Reliability of the pectoralis major myocutaneous flap in reconstructive oral cancer surgery in developing countries: our experience. *Med J Armed Forces India.* 2016;72(Suppl 1):S1-S7.
3. Fernandes R. Local and regional flaps in head and neck reconstruction: a practical approach. Hoboken (NJ): Wiley-Blackwell; 2014.
4. University of Iowa Health Care. Pectoralis major myocutaneous flap and myofascial flap [Internet]. Iowa City: University of Iowa Health Care; 2017 [cited 2017 Nov 10]. Available from: <https://medicine.uiowa.edu/iowaprotocols/pectoralis-major-myocutaneous-flap-and-myofascial-flap>
5. Edge S, Byrd DR, Compton CC, Fritz AG, Greene FL, Trotti A, editors. *AJCC cancer staging manual.* 7th ed. New York: Springer-Verlag; 2016.
6. Pinto FR, Malena CR, Vanni CM, Capelli FA, Matos LL, Kanda JL. Pectoralis major myocutaneous flaps for head and neck reconstruction: factors influencing occurrences of complications and the final outcome. *Sao Paulo Med J.* 2010;128(6):336-41.
7. McLean JN, Carlson GW, Losken A. The pectoralis major myocutaneous flap revisited: a reliable technique for head and neck reconstruction. *Ann Plast Surg.* 2010;64(5):570-3.
8. Lima VS, Pruinelli R, Gava VG, Silva VL. Myocutaneous flap of pectoralis major muscle: results and complications in a series of 116 cases. *Rev Bras Cir Plást.* 2010;25(3):484-9.
9. Tripathi M, Parshad S, Karwasra RK, Singh V. Pectoralis major myocutaneous flap in head and neck reconstruction: an experience in 100 consecutive cases. *Natl J Maxillofac Surg.* 2015;6(1):37-41.

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