Prediction of Early and Late Complications after Oral Mucosal Graft Harvesting: Multivariable Analysis from a Cohort of 553 Consecutive Patients

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Abbreviations and Acronyms

OM = oral mucosa

RCT = randomized prospective trial

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Study received institutional review board approval.

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Purpose: We investigated the early and late complications after oral mucosal graft harvesting, and reported the independent predictors of outcome via multivariable analysis.

Materials and Methods: We performed a retrospective descriptive study of 553 patients from whom an oral mucosa graft was harvested for urethroplasty from single or bilateral cheeks. Patients who underwent oral mucosa harvesting from the lip, the tongue or from the cheek and lip at the same time were excluded from analysis. The oral graft was harvested in an ovoid shape with closure of the wound. Postoperative early and late complications were investigated using a self-administered, nonvalidated, semiquantitative questionnaire. There were 6 questions on early complications, and 13 questions investigated late complications and patient satisfaction.

Results: Descriptive statistics of categorical variables focused on frequencies and proportions. Univariable and multivariable analyses were used to predict early and late dissatisfaction of patients. Bleeding was reported in 3.4% of patients. Overall 53.2% of patients did not report any pain and 36.3% reported no swelling. Late complications analysis showed that 95.5% of patients declared that the surgical closure of the wound did not cause any difficulty in opening the mouth or problems with smiling (98.2%) and/or dry mouth (95.8%). Overall 98.2% of patients were satisfied with the procedure. Univariable and multivariable analyses revealed that bilateral graft harvesting was the only significant predictor of patient dissatisfaction (OR 2.85, $p = 0.01$ and OR 2.72, $p = 0.02$; respectively).

Conclusions: Harvesting the oral mucosa ovoid graft from a single cheek with closure of the wound is a safe procedure with high rates of patient satisfaction.

Key Words: mouth mucosa, cheek, urethra, postoperative complications, questionnaires

ORAL mucosa is the most popular substitute material for urethral reconstruction, a practice which began in the 19th century by Sapezhko in Russia.[1,2] OM is easy to harvest as it provides simple accessibility and a concealed donor site scar, and obviates most of the problems associated with other graft harvesting.[3,4] However, the success of OM in urethral surgery can be mainly attributed to the biological properties of this tissue.[4]

Markiewicz et al reviewed pertinent literature from 1996 through

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2006 including 1,353 cases involving OM based urethroplasty for urethral stricture or hypospadias-epispadias.[3] Reconstruction for urethral stricture and hypospadias-epispadias was successful in 418 (66.5%) and 553 (76.4%) cases, respectively.[3] The 2 most common sites of OM harvest found in the literature are the cheek and the lower lip.[3]

Nevertheless, some authors have reported that OM harvesting is associated with early and long-term oral complications or sequelae such as pain, perioral numbness, tightness of the mouth, persistent difficulty with mouth opening, change in salivary function and motor deficits, among others.[5–9] An overview reporting an overall rate of donor site complications demonstrated no statistical difference between cheek or lip, with a morbidity rate of 3% to 4% for both sites.[8] Postoperative scarring and contracture in the harvesting site were more frequent in patients undergoing harvest from the cheek than in those undergoing labial harvest.[8] However, labial harvest can impinge on the mental nerve, causing perioral numbness or other complications.[8] Therefore, in a consecutive cohort of 533 patients we investigated the early and late complications of oral mucosal graft harvesting, and reported the independent predictors of satisfaction via multivariable analysis.

MATERIALS AND METHODS

We performed a retrospective descriptive analysis of prospective collected data from a cohort of 553 patients who underwent OM graft harvesting at our center between September 1998 and September 2012. The institutional review board approved the study. Patients met the study inclusion criteria if they underwent OM graft harvesting from single or bilateral cheek for urethroplasty. Patients who underwent OM harvesting from the lip, the tongue, or from the cheek and lip at the same time were excluded from the study. Furthermore, non-Italian language speaking patients and patients with evident cognitive impairment (ie Down syndrome) were excluded from analysis.

The primary outcome measure was the incidence of early and late oral complications, and was recorded using an internal, self-administered, semiquantitative, nonvalidated questionnaire.[10] The questionnaire included 6 questions designed to investigate early (first 10 postoperative days) complications (bleeding, pain, swelling, time to resume normal diet) and 13 questions designed to investigate late (4 months after surgery) complications (numbness, infection, changes in sensitivity-sensibility, difficulty in mouth opening, difficulty in smiling, dry mouth, swelling, time to resume normal diet) as well as patient satisfaction (see supplementary Appendix, http://jurology.com/). A semiquantitative analysis was performed using a scoring system ranging from 0 to 3, where 0 was the absence of complications or symptoms and 3 was the worst complication or symptom experienced.

The secondary end point investigated was patient satisfaction. We evaluated the total patient questionnaire score, and using cutoff values of 7 or greater and 10 or greater we designated patients as early unsatisfied or late unsatisfied, respectively. All patients were asked to self-complete the questionnaire 10 days after surgery for early complications and then at 4 months after surgery for late complications during scheduled followup visits.

Preoperative Patient Preparation

Patient clinical history as well as stricture etiology, site and length are carefully evaluated preoperatively to define the characteristics needed in the OM graft. Patients and anesthetists are informed if surgery may require bilateral cheek graft harvest. In patients who chew tobacco or pan masala, the oral graft tends to have diffuse fibrosis of the submucosal layer of the inner cheek.[11] In these patients the use of retroauricular skin should be an alternative.[12] Three days before surgery the patient begins oral cleansing with a chlorhexidine mouthwash. The day before surgery the patient receives intravenous prophylactic antibiotics.

Surgical Technique

The patient is intubated through the nose, and 2 teams work simultaneously at the donor and recipient sites, each with their own set of instruments (fig. 1). Nasal intubation is not mandatory but it is useful for surgeons at the beginning of their learning curve or in patients with a limited mouth opening. A Kilner-Doughty mouth retractor is put in place and the Stensen duct is marked in proximity of the second molar. If the Stensen duct cannot be clearly identified, applying some drops of lemon juice to the tongue can stimulate secretion from the parotid gland. Three stay sutures are placed along the edge of the mouth to stretch the oral mucosa. Usually the graft is designed in

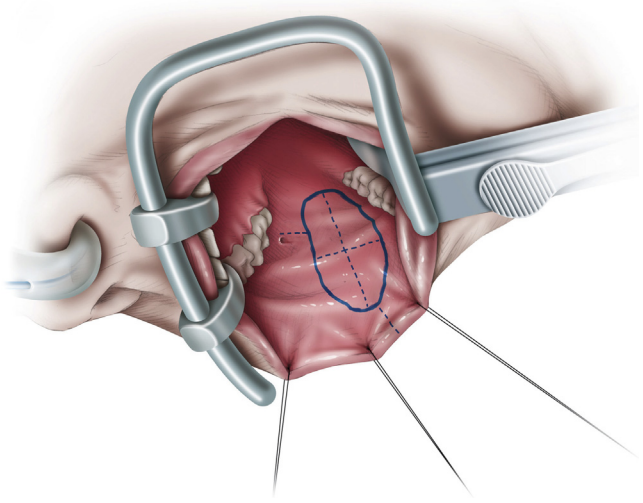

Figure 1. Patient is intubated through nose, Kilner-Doughty mouth retractor is put in place and Stensen duct is marked in proximity of second molar. Three stay sutures are placed along edge of mouth to better stretch oral mucosa and graft is designed in ovoid shape. Graft is harvested 1.5 cm from Stensen duct and 1.5 cm from external edge of cheek.