Comparison of uni- and bilateral buccal mucosa harvesting in terms of oral morbidity

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ABSTRACT

Objective: To evaluate the intraoral morbidity associated with uni- or bilateral buccal mucosa graft harvesting in the treatment of urethral stricture.

Material and methods: Forty-two men with anterior urethral stricture who were treated with dorsal onlay buccal mucosal graft urethroplasty were enrolled in this study. The graft was harvested from both cheeks in patients with a stricture length of ≥ 7 cm and from one cheek, if the stricture length was < 7 cm. The post-operative pain scores, the time required both to return to a regular diet, and also to achieve full mouth opening, intraoral numbness and the salivary changes were compared between two groups.

Results: The bilateral buccal mucosal graft harvest group was disadvantaged in terms of the 7th day pain score, the time required both to return to a regular diet also to achieve full mouth opening ($p < 0.05$). No significant intergroup differences were found in the terms of salivary changes and intraoral numbness.

Conclusion: Although, intraoral morbidity of bilateral buccal mucosa graft harvesting is more marked than that of the unilateral harvesting, in the short term, it is well tolerated by the patients in the long term.

Key words: Buccal mucosa; urethral stricture; urethroplasty.

Introduction

Shorter urethral strictures (≤ 2 cm) is repaired primarily with end-to-end anastomosis, for stenosis of longer urethral segment, urethroplasties with onlay tissue grafts are preferred because of the risk of postoperative chordee formation. To achieve higher success rates with onlay graft urethroplasties has led to search for ideal tissue grafts to be harvested. Nowadays, a consensus has been mostly reached on the use of buccal mucosa.^[1] However, any consensus has not been formulated on whether the defect formed should be closed or left open. Some authors reported that leaving the defect open have favorable effects as early recovery from postoperative pain, requirement of shorter time interval up to full mouth opening, and earlier switch to normal diet. While others have attributed these effects to the length, and shape of the graft harvested, and advocated closure of the defect.^[2,3] Generally strictures of ≤ 7 cm, buccal mucosa harvested from one cheek

is sufficient, for longer strictures grafts from both cheeks or buccal mucosa excised from one cheek, and mandibular region is required.

In the literature, any clear-cut information is lacking on the impact of buccal mucosa harvested from both cheeks on intraoral morbidity. With this study, we aimed to compare intraoral morbidity of harvesting buccal mucosal graft from one or both cheeks.

Material and methods

Forty-two patients who had undergone dorsal onlay buccal mucosa graft urethroplasty between January 2003, and July 2010 with the indication of anterior urethral stricture were included in the study. Mean follow-up period was 44.2 months (12-98 mos). For pre-operative evaluation, medical histories were obtained, physical examination, retrograde, and voiding cystourethrograms, urinalysis, and urine cultures were performed. Mean age of

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Submitted:
18.07.2012

Accepted:
14.08.2012

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the patients was 57 (26-77 yrs) years. Strictures were related to iatrogenic (n=21; 50%), ischemic (n=6; 14.3%), traumatic (n=11; 26.2%) factors. While in 4 patients (9.5%) its etiology could not be determined. Buccal mucosa grafts were harvested from two cheeks of 19 patients (Group 1) with longer urethral stenotic segments (≥ 7 cm), while in 23 patients with a urethral stenotic segment shorter than 7 cm (Group 2), buccal mucosal grafts from one cheek were retrieved.

Operation technique

Operation was performed under general anesthesia using nasotracheal intubation. A perineal midline incision was made on the stenotic segment, bulbar urethra was dissected, and separated from cavernosal corpora. The length of the stenotic segment was measured. Oral cavity was prepared sterile. Stensen canal was identified, and the location to be grafted was marked. After local injection of lidocaine HCL with 1% (1/100.000) adrenaline, graft was harvested using sharp dissection. For the stenotic segments of ≥ 7 cm, and < 7 cm, standardized grafts with dimensions of 5 cm x 2.5 cm were harvested from the buccal mucosa of one, and both cheeks, respectively. Hemostatic control was achieved using bipolar cautery. In all patients, defect formed from the grafted location was left open. Later on, stenotic segment was excised from its dorsal aspect, and onlay buccal mucosa graft was placed *in situ*, and fixated to the tunica albuginea of corpora spongiosa. Bulbocavernous muscles were closed over spongy tissues. Colles fascia, perineal adipose tissue, and skin were approximated with sutures in that order. An *in situ* drain was placed, and removed one day later. Urethral catheter was withdrawn 2 weeks later. Two weeks after surgery a voiding cystourethrography was performed. In cases with extravasation catheter was kept *in situ* for one week. the patient was prescribed ice cream, and fluid diet on the postoperative 1. day, and switched to a normal diet one day later.

Postoperative pain score, time to switch to a regular diet, and full mouth opening, changes in the intraoral numbness, and amount of saliva were recorded, and these two groups were compared as for these parameters. For the evaluation of postoperative pain, visual analogue scale (VAS) consisting of 10 items was used. VAS scores were evaluated daily for the first week, and then monthly for the subsequent six months. Data of other parameters were retrieved retrospectively from patient files, and they were confirmed by the questionnaires completed by the patients during their last control visits (Addendum 1).

Statistical analysis

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) 15.0 (SPSS INC, Chicago, IL, USA). For the analysis of data, independent samples-t test was used.

Results

A total of 42 patients who completed 6 months of follow-up period, and filled up their questionnaire forms formulated to confirm the data, were included in the study. Mean ages of the patients were 55 (27-77), and 53 (25-76) years in Groups 1, and 2, respectively. Both groups consisted of age-matched patients. ($p>0.05$). In Group 1, bleedings from the grafted region occurred in two patients on the day of switching to normal diet which required cauterization, however, in Group 2 any bleeding episode was not observed.

Although, pain scores on postoperative 1. days were higher in Group 1, any statistically significant intergroup difference was not found ($p=0.18$). Pain scores estimated during the period between postoperative 2., and 7. days in Group 1 were statistically significantly higher relative to Group 2 ($p=0.006$). These relatively higher pain scores of Group 1 were maintained up to 1. postoperative week, thereafter any statistically significant intergroup difference was not detected as for pain scores. On control visits performed at 6. months all patients were devoid of pain (Figure 1).

On postoperative 2. days, 4 patients in Group 1 (21%), and 16 (70%) cases in Group 2 could tolerate normal diet. Patients in Groups 1, and 2 could return to normal diet average of 4.53 days (2-8 d), and 2.44 days (2-4 d) after the operation, respectively ($p<0.05$).

Full mouth opening on postoperative 7. days was detected in 5 (26%), and 20 (87%) patients in Groups 1, and 2, respectively. Time to achieve full mouth opening was an average of 8.47, and 2.65 days in Groups 1, and 2, respectively ($p<0.05$). At 6. month-control visits all patients achieved their preoperative full mouth openings.

At the end of the first postoperative week, a statistically significant intergroup difference was not detected as for intraoral numbness. At 6. month-control visits, intraoral numbness was more severely felt by Group 1 patients without reaching any statistically significant intergroup difference ($p=0.12$).

Change in the amount of saliva described by the patients was similar in both groups during the entire follow-up period.

Favorable responses were obtained in 63, and 83% of the patients in Groups 1, and 2, respectively to the last question 'If required, would you undergo the same operation with the buccal graft harvested from the same region at a later date?'

Figure 1. Mean pain scores of buccal mucosa harvesting from one (Group 1) and both (Group 2) cheeks

Discussion

Since, Humby described use of buccal mucosa for urethral reconstruction in hypospadias repair in 1941, this technique has gained popularity in the repair of longer urethral segments especially for the last 20 years.^[4] Although, in most of the literature studies buccal mucosa has been used, studies have been also performed with harvested mandibular alveolar, labial, and lingual mucosa grafts.^[5,6] In some studies where labial, and buccal mucosal grafts were compared, harvesting buccal mucosa has been associated with lesser morbidity.^[6,7]

Opinions about dimensions, shape, and the closure or non-closure of the defect formed are still controversial. In a randomized prospective study performed by Rourke et al.^[2], the investigators advocated that non-closure of the defect formed by graft will have favorable effects on relief of early postoperative pain, the time to the achievement of full mouth opening, and return to normal preoperative diet. However, Barbagli et al.^[3] in consideration of their prospective analysis, related these differences to the dimensions, and shape of the harvested graft. As a standard, we harvested buccal mucosal grafts with dimensions of 2.5 x 5 cm from all patients. These grafts can be elongated nearly 6.5-7 cm with reconfiguration, for longer stenotic segments we used buccal mucosa of both cheeks. Also authors who harvested grafts longer than 5 cm have been cited in the literature, Barbagli et al.^[3] indicated that dimensions of the graft harvested to prevent postoperative complications should not exceed 4 cm x 2.5 cm.^[6,8]

Studies in the literature are generally related to oral complications of buccal mucosa harvested from one cheek. As far as we can know, any study analyzing oral complications related to harvesting bilateral buccal mucosal graft has not been encountered in the literature. Herein, we aimed to investigate the effect (if any) of harvesting buccal mucosa of both cheeks on oral complications.

Even though early postoperative pain scores of buccal mucosal graft harvested from one cheek resemble those found in the other literature studies, postoperative pain scores of the patients who had undergone bilateral buccal mucosal grafting were markedly higher. These increased intergroup differences were seen from the 2. postoperative day on. When the patients who had experienced unilateral buccal mucosal graft harvesting were interrogated, they expressed that they had tried to chew solid foods inside the cheek with intact mucosa without turning them all inside their mouth when they started on normal diet. Higher pain scores of the patients with harvested bilateral buccal mucosal grafts, and longer transition time to normal diet were associated with this phenomenon.

In 2 patients in Group 1, bleeding requiring cauterization was seen on the grafted region. Though grafted site bleedings requiring cauterization have been reported in the literature, their association with transition to normal diet has not been indicated.

In our study, time to full mouth opening was found to be statistically significant in Group 1. Healing period of the defect caused by bilateral buccal mucosal graft, and its replacement by the mucosal tissue which gained its full elasticity might be effective on this process. In some studies intraoral contractures have been detected in the long-term.^[7] In this study, intraoral contracture did not developed in any one of our patients.

In conclusion, even though morbidity of harvesting buccal mucosa grafts from both cheeks is more marked in the short-term when compared with the grafts from one cheek, in the long-term this morbidity is fairly tolerated by the patients. Especially in cases requiring longer segments, we think that the issue whether grafts should be harvested from buccal mucosa of both cheeks or from an area extending to the mandibular alveolar region will be the subject of further investigations with respect to their complications.

Conflict of Interest: No conflict of interest was declared by the authors.

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ADDENDUM 1. Postoperative Questionnaire Form

1. Please rate, and mark the severity of your perception of pain inside your mouth using the following pain scale ranging from 'no pain' (0) to 'very severe pain' (10)

0 1 2 3 4 5 6 7 8 9 10

2. How many days after the operation you have started to eat your conventional diet?

..... days after the operation

3. When could you open your mouth as wide as you did before the operation?

..... days after the operation

4. Have you felt numbness inside your mouth? If your answer is 'yes' then specify the time interval

..... hours/days after the operation

5. Has the amount of your saliva changed ? If so for how long did it persist?

Duration :

6. If for your preexisting disease, the same operation were recommended to you, would you consent to it ?

Yes

No