Evaluation of intraoral complications of buccal mucosa graft in augmentation urethroplasty

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ABSTRACT

Objective: To evaluate intraoral complications of buccal mucosa grafts harvested from one cheek, and used in augmentation urethroplasty.

Material and methods: Twenty-one patients with anterior urethral strictures were included in our study. In twelve patients, dorsal onlay, in five patients ventral onlay and in four patients lateral onlay procedures were applied. Average length of buccal mucosa graft from one cheek was 5.2 cm (3-8 cm). In all graft harvesting patients, bleeding in graft side, swelling, pain intensity of oral or perineal area, analgesic use, transition time to normal diet, slurred speech, loss of sensation, and patients' opinions about oral mucosa regrafting using this technique were evaluated using nine-item questionnaire forms.

Results: Eighteen (85.7%) of our patients had mild pain, 13 (61.9%) had mild intraoral swelling, none of our patients had oral bleeding that needed extra procedure and all of our patients were observed to start off their normal diet in the first 3 days. Twelve (57.1%) of our patients needed analgesic agents after the operation while 14 (66.7%) of them have remarked that perineal incision was more painful. Twenty (95.3%) of our patients stated that they could go under the same procedure again. None of our patients had speech disorders or intraoral numbness.

Conclusion: Even though buccal mucosal grafting used in augmentation urethroplasty is not a completely painless procedure, buccal mucosa graft is an ideal source of allograft in terms of safe and easy obtainance and improved patient tolerance.

Key words: Augmentation urethroplasty; buccal graft complications; urethral stricture.

Introduction

Despite continuous developments in the treatment of urethral strictures, they are still one of the most challenging, and complex topics of the urology practice.^[1] In selected cases, minimally invasive techniques as internal urethrotomy under direct vision, urethral dilation, and stent implantation can be applied, but with higher failure rates.^[2,3] In cases with longer, and complicated anterior urethral strictures not amenable to end-to-end anastomosis of anterior urethra, genital, and extragenital skin, tunica vaginalis, bladder, lingual, and buccal mucosa, and different substitution materials as skin engineering grafts can be used.

Buccal mucosa graft (BMG) is an ideally acceptable allograft transplant material which has found a wider application area in the field of substitution urethroplasty.^[4-6]

Despite such a preferable method, following graft harvesting, intraoral bleeding, pain, and swelling, salivary duct injury, restricted oral opening, esthetic problems secondary to scar formation, sensory changes due to nerve injury, and intraoral numbness have been reported.^[7,8]

In this study, in patients in whom we used BMG, we evaluated post-grafting complications which might effect quality of life of patients who underwent augmentation urethroplasty with the indication of anterior urethral stricture.

Material and methods

Among a total of 36 patients, 21 cases who underwent open augmentation urethroplasty using BMG with the indication of anterior urethral strictures between May 2010, and October 2013 were included in this prospective study. The

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Table 1. Quality of life, and complication assessment form following BMG harvesting

Questions	Responses			
1. Have you noticed any bleeding within the first 3 days following grafting?	- Yes	- No		
2. How is the severity of pain (if any) after grafting?	- None	- Mild	- Moderate	- Severe
3. Have you had oral swelling after grafting?	- None	- Mild	- Moderate	- Severe
4. How long did it take for you to return to your normal daily diet ? (days)	- 0-3	- 4-6	- 7-10	
5. Which surgical wound site was more painful?	- Oral	- Perineal	- Both	- None of them
6. Have you taken any painkiller?	- Yes	- No		
7. Have you had speech disorders?	- Yes	- No		
8. Do you feel numbness on your cheek, and lips?	- Yes	- No		
9. Will you willingly undergo the same operation in case of need?	- Yes	- No		
BMG: buccal mucosa graft				

harvested grafts were applied as dorsal onlay (n=12), ventral onlay (n=5), and lateral onlay grafts (n=4). As etiological factors of the stricture, trauma (n=4; 19.1%), infection (n=4; 19.1%), urethral catheterization (n=4; 19.1%), transurethral resection (TUR) operation (n=9; 42.8%), and lichen sclerosus (n=1; 4.8%) were detected. Preoperative evaluation of the patients was performed based on medical history, physical examination, uroflowmetry, retrograde urethrography, voiding cystourethrography, and urine cultures.

Graft harvesting

In eligible patients for anesthesia, nasotracheal intubation was preferred. A surgical team approached to the urethral stricture region through perineal incision while the patient was in the lithotomy position, and another team prepared the oral cavity for harvesting of BMG. Following determination of the length of the stenotic urethral segment, graft harvesting region was marked from 1.5 cm medial to the commissure, and 1 cm below the Stensen duct, and fixated with two suspension sutures. To avoid trauma to the cheek muscles, and facilitate dissection, adrenaline diluted (1/100,000) with saline solution was injected *in situ*. Always, a BMG 2 cm longer than required was harvested with sharp dissection from one cheek. After the procedure graft bed was not cauterized, and the wound site was closed with continuous 4/0 vicryl sutures. (Figure 1). Up to the termination of the urethral anastomosis, compression pad was applied inside the cheek. All patients used oral mouth-washes containing 0.15 g benzydamine solution.

Evaluation of the patients

Using a 9-item questionnaire form, the patients were evaluated on postoperative 10. days as for the presence of intraoral bleeding, submucosal hematoma, mucosal edema, analgesic use (if any), pain, edema, mouth swelling, transition time to normal diet, comparative pain intensities of felt at both incisional areas,

Figure 1. Closure of the graft harvesting site with continuous sutures

slurred speech, and mouth numbness (Table 1). During long-term follow-up periods, complications were evaluated based on the patient's complaints.

Results

Median age of the patients was 59 years (35-79). The length of the BMG graft used in augmentation urethroplasty was

Table 2. Patients' responses to the questions, and related percentiles

		(n)	(%)
Question 1	Yes	1	4.7
	No	20	95.3
Question 2	Painless	0	0
	Mild	18	85.7
	Moderate	3	14.3
	Severe	0	0
Question 3	No swelling	7	33.3
	Mild	13	61.9
	Moderate	1	4.8
	Severe	0	0
Question 4	0-3 days	21	100
	4-6 days	0	0
	7-10 days	0	0
Question 5	Oral	6	28.6
	Perineal	14	66.7
	Both of them	0	0
	None of them	1	4.7
Question 6	Yes	12	57.1
	No	9	42.9
Question 7	Yes	0	0
	No	21	100
Question 8	Yes	0	0
	No	21	100
Question 9	Yes	20	95.3
	No	1	4.7

5.2 cm (3-8). Median follow-up period was 19.2 months (3-40 months), and our surgical success rate was 80.9 percent. Percentiles of response rates related to the questions in the evaluation forms are seen in Table 2. The item questioning the severity of the pain felt by the patients was indicated as mild (n= 18; 85.7%) and moderate (n=3; 14.3%). All of our patients started to switch to their normal diet within the first 3 postoperative days. Intraoral swelling was not detected in 7 (33.3%) patients. A mild intraoral edema was encountered in 13 (61.9%) patients. In none of our patients serious bleeding which required additional procedures was noted. In only one patient blood oozing was stopped with compression pads. As indicated by the patients, pain was felt more severely at the perineal incision site (n=14; 66.7%) rather than oral graft harvesting site (n=6; 28.6%). Postoperatively, 12 (57.1%) patients reported that they had required analgesics, while 9 (42.9%)

patients did not use any painkiller. Our 20 (95.3%) patients indicated that they would undergo the same procedure again, in case of need. In none of the patients, slurred speech, and intraoral numbness were detected during the postoperative follow-up period.

Discussion

Oral mucosal grafts (OMGs) were used firstly by Humby in 1941 in an unsuccessful hypospadias surgery. Since then OMGs have been used. In the year 1992, Burger and Dessanti reintroduced OMGs into reconstructive urology, and popularized this procedure. Nowadays, in cases with long, and complicated urethral strictures OMGs have become a part of the standard therapy.^[9,10] Anatomical, and physiological features of OMGs, are the most important consideration favouring use of these grafts. This graft is preferred in that it is easily available, and has a nonkeratinized, thick epithelium, and a thin lamina propria. Besides it is resistant to microbial agents, and highly histocompatible with the urethral mucosa.^[7]

In many studies which evaluated complications of buccal mucosa, complications were related to the graft size, shape, open-wet or closed (occlusive) dressing of the graft wound, and graft harvesting site. Graft harvesting sites include buccal mucosa, mandibular alveolar region, lower lip, and lingual mucosa. Potential graft harvesting site complications include bleeding, postoperative infection, pain, swelling, salivary duct disorders, restricted mouth opening, scar formation, contracture, and loss of sensation due to nerve injury.^[7,11,12]

Following buccal mucosa graft harvesting, bleeding is seen in 1-5% of the patients.^[7,8] In a study evaluating 169 patients including pediatric age group, higher (21%) rate of bleeding was reported.^[13] The authors attributed this higher rate to open dressing they performed after graft harvesting from the lower lip, and avoidance from using cautery so as to prevent nerve injury. In our study, buccal graft retrieval site was primarily closed with continuous sutures, and submucosal hematoma did not develop in any patient. Blood oozing from the incision site was stopped with compression.

In their review article, Markiewicz et al.^[7] compared lower lip-cheek regions, and indicated that graft site complications developed dependent on graft harvesting site and stated that grafts retrieved from cheeks had lower complication rates when compared with grafts harvested from the lower lip. Still, Barbagli et al.^[14] indicated that the graft size was important in the prediction of postoperative complications. In a study performed in our

country which evaluated intraoral complications related to buccal mucosa grafting, the authors expressed that graft harvesting from both cheeks induced higher postoperative pain scores, and longer transition times to normal diet. However in the long run, this morbidity was tolerated quite fairly by the patients.^[15] Contrary to those recommending occlusive dressing of the graft site, some authors have advocated that leaving the surgical wound site to secondary healing decreases intensity of postoperative pain, and has ameliorating effects on the development of scar, and contracture formation which consequently shortens the time to recovery of normal range of mouth opening, and return to normal diet. It has been reported that restricted mouth opening occurs more frequently as a result of graft harvesting, and suturing procedures performed on the labial commissure of the mouth near the skin which heals at most within 4 weeks.^[8,11,12,16] In our study we didn't leave the wound site open, and so didn't encounter any problem concerning postoperative pain, and ROM of the mouth.

Another frequently long-term complication seen following graft harvesting is intraoral loss of sensation due neuropraxia. In their study, Dublin et al.^[8] indicated presence of postoperative intraoral numbness in 57% of their cases. Castagnetti et al.^[13] used a more objective evaluation method based on the measurement of tactile, and thermal sensitivity, and after a long-term (8 year) follow-up period, they detected loss of sensation in 28% of their patients.

Loss of sensation has been more frequently related to the injury of the mental nerve (nervus mentalis) which innervates lower lip during graft material harvesting from the lower lip or its cauterization, in addition to buccal nerve injury during aggressive dissection to the posterior direction in order to retrieve longer graft material.^[8,11,13] In our study, any incident of loss of sensation, and numbness was not detected based on the self-reports of the patients. Besides, during our mean follow-up period of 19.2 months, slurred speech, and mucosal contracture on the graft harvesting site were not observed in our patients.

Despite these outcomes obtained, our study has some limitations including scarce number of our patient population, lack of validation of the questionnaire form, and any comparator group in addition to relatively shorter follow-up period.

In conclusion, though postoperative period following BMG harvesting is not completely painless, still BMG is a frequently preferred urethral graft material for augmentation urethroplasty which when complied with the standard procedures it is an ideal urethral graft material with minimal morbidity.

Ethics Committee Approval: Since our study was a questionnaire survey, it was not submitted to the ethics committee for approval.

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