MORBIDITY AND INITIAL RESULTS OF URETHROPLASTY WITH ORAL MUCOSA GRAFT, COLLECTED FROM THE LOWER LIP UNDER LOCAL ANESTHESIA

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REZUMAT
Introducere: Urethroplastia cu mucoasă bucală este o metodă terapeutică acceptată în patologia uretrală și în ultimii ani a fost cea mai răspândită metodă utilizată în rezolvarea stricturilor uretrale anterioare. Material și metode: S-a realizat un studiu retrospectiv al celor 15 pacienți operați prin uretroplastie peniană cu mucoasă bucală recoltată de la nivelul buzei inferioare în anestezie locală în perioada 2007-2011. Au fost evaluate rezultatele uretroplastilor, morbiditatea și complicațiile intervențiilor și s-a evaluat gradul de satisfacție al pacienților prin două chestionare. Rezultate, discuții: Majoritatea pacienților (80%) nu au acuzat durere sau parestezii în momentul prelevării, iar durerile postoperatorii au fost ușoare (26,6%). Referitor la rezultatele uretroplastilor, numărul redus de cazuri nu oferă concluzii clare din punct de vedere statistic. Scopul articoului este în principal de a prezenta posibilitatea accesului la uretroplastia cu mucoasă bucală fără anestezie generală. Recolta de grefă de mucoasă bucală în anestezie locală de la nivelul buzei inferioare este bine suportată de pacienți, deși nu oferă material de substituție de aceeași calitate și dimensiune, comparativ cu grefa de la nivelul obrajilor. Concluzii: Grefa de mucoasă bucală rămâne un material excelent și acceptat pe scară largă pentru substituția uretrală. Rezultatele la intervalul de timp de 2 ani de după interventia s-au evidențiat concluziile clare pentru eficacitatea și siguranța acestei intervenții. Cuvinte cheie: mucoasă bucală, grefă, strictură uretrală, uretroplastie

ABSTRACT
Introduction: Urethroplasties using oral mucosa are an accepted therapeutic method in urethral pathology and in recent years was the most commonly method used in solving anterior urethral strictures. Material and methods: A retrospective study was performed involving 15 patients with penile urethral strictures operated using oral mucosa harvested from the lower lip under local anesthesia in 2007-2011. Results of the urethroplasties were evaluated, morbidity and complications of the interventions, patient satisfaction were assessed using two questionnaires. Results, discussion: Most patients (80%) did not experience pain or numbness at the time of harvesting, and postoperative pain was mild (26.6%). Because of the limited number of cases, the results of the urethroplasties do not provide statistically clear conclusions. Paper mainly raises the possibility of urethroplasty using buccal mucosa without the use general anesthesia. Buccal mucosa graft harvesting in local anesthesia of the lower lip is well tolerated by patients, although the material it offers for substitution is not the same quality and size compared with the graft in the cheeks. Conclusions: Buccal mucosa graft remains an excellent and widely accepted material for urethral substitution. Buccal mucosa graft harvesting in local anesthesia is a safe procedure and generally well accepted by patients.

Key Words: oral mucosa, graft, urethral stricture, urethroplasty

INTRODUCTION

Urethral strictures are common in the elderly urological patients, especially after transurethral prostate or bladder resections. Moreover, elderly patients undergo more frequently urethral catheter placement before other surgical interventions, for clinically apparent or asymptomatic prostatic benign hyperplasia.

In the unpublished series of the Department of Urology of the Odorheiu Secuiesc Municipal Hospital, the etiology of the urethral strictures in the elderly was as follows:
- 60% following urethral catheter placement or rigid cystoscopy;
- 26% after transurethral prostate resection;
- 12% after transurethral bladder tumor resection;
- 2% idiopathic.

The timeframe between the intervention on the urinary tract and the clinical manifestation of the stricture is variable, and depends on the severity and location of the stricture, and on the level of the patient’s perception as well. Generally, a urethral stricture becomes symptomatic when the minimum diameter of the urethra is under 11 Ch.

Due to the associated pathology and anesthesia risks, the elderly patient is treated by internal optical urethrotomy as initial treatment. The results have
been evaluated by Pansadoro and Emiliozzi in 1996. Recurrence rate for the penile urethra stricture is 84%, and 58% for bulbar urethra. After the second urethroplasty, the outcomes are worse in most cases.

Urethroplasty with oral mucosa graft is a more suitable intervention, with higher success rates on the long term. The graft is placed dorsally on the penile urethra, on the albuginea of the cavernous bodies, which represent an appropriate mechanical and vascular supporting structure. Ventral placement is risky, as the frequently thin and scarred spongy body cannot always cover it, and provide vascular supply to the graft. Placement can be performed dorsally as onlay, obtaining an extra 2.5 cm, or as dorsal inlay (Asopa), obtaining only 1.5 cm, and requiring the incision of the superior urethral wall. A thin superior urethral wall will make the dorsal inlay procedure difficult, and a severe spongiofibrosis will raise difficulties in the dissection and rotation of the spongy body for dorsal incision. In such cases skin flaps or two-step interventions will be employed.

Recent literature has demonstrated the superiority of urethroplasty with oral mucosa graft of the penile urethra versus internal urethroplasty. Basically, oral mucosa collection is performed under general anesthesia with naso-tracheal tube. Anesthesia of the elderly patient has several risks due to associated diseases. Cognitive decline following general anesthesia of the elderly is an established entity. Nevertheless, patients in need of a graft will be evaluated preoperatively in order to identify any local pathology that might contraindicate oral mucosa grafting. Patients requiring a thin graft (for bulbar urethroplasty) will be informed that collection oral mucosa grafting. Patients requiring a thin graft (for penile urethroplasty) will be informed that collection oral mucosa graft collection is dependent on the size of the graft and anatomical site of collection.

**MATERIAL AND METHODS**

A retrospective study has been performed, of the 15 patients who underwent penile urethroplasty with oral mucosa graft, collected from the lower lip under local anesthesia. The interventions have been performed between 2007 and 2011. The follow-up period was 3 to 50 months. The patients were aged 54 – 72 years.

The following parameters were assessed: the results of the urethroplasties, morbidity and complications of the interventions, as well as the degree of the patient’s satisfaction using two questionnaires - one concerning the urethral surgery, and the other concerning the oral mucosa graft collection. (Appendix 1, 2). The second questionnaire was taken and translated from the article published by Barbagli et al.

Patients with urethroplasty performed on the bulbar urethra, and those with oral mucosa collected under general anesthesia were not included.

**Operating technique**

**Collection of oral mucosa graft**

The collection technique needs to be simple, safe and reproducible, based on solid anatomical foundations, and performed using adequate tools.

**Preoperative preparation**

Preoperative diagnosis includes urine culture, retrograde and voiding urethrography, and urethroscopy. Clinical examination and patient history will establish as accurately as possible the etiology of the urethral stricture in order to aid in deciding the operating technique. The site and length of the stricture should be evaluated carefully as well, as these will determine preoperatively the characteristics of the oral mucosa graft.

The oral cavity has to be evaluated preoperatively in order to identify any local pathology that might contraindicate oral mucosa grafting. Patients in need of a graft will be evaluated preoperatively in order to identify any local pathology that might contraindicate oral mucosa grafting. Patients requiring a thin graft (for penile urethroplasty) will be informed that collection will be performed from the lower lip mucosa.

Patients with oral mucosa disorders or limited jaw opening will be informed that in their case genital or extragenital (thigh, retroauricular) skin graft will be used for urethroplasty.

Patients undergoing urethroplasty with oral mucosa will receive intravenous broad spectrum antibiotic (ex. Ceftriaxone 1g, every 12 hours) a day before the intervention, on the day of the intervention, and for the following 3 days. Three days before the intervention the patient will receive an oral disinfectant (oral chlorhexidine), and will continue rinsing for 3 days after the intervention.

**Description of lower lip grafting under local anesthesia**

Before lumbar anesthesia we used an anesthetic spray containing 1% xylocaine applied to the oral cavity and lower lip. Then we proceeded with collection of the graft. An assistant holds the lower lip visible, and after lifting of the graft through infiltration with a solution.
containing 1% xyline and 1:100,000 adrenaline, the graft is collected in a 3/1.5 cm sized elliptical shape. In some cases a 4/1.5 cm graft can be obtained, depending on the local anatomy. Lateral extension of the dissection beyond the canines may lead to mental nerve damage and consecutive paresthesia. Excision at less than 1 cm from the edge of the lip may cause the inward retraction of the lower lip, leading to an unpleasant esthetic result. Likewise, the graft margin should be over 1 cm away from the dental arch. The graft is anchored with suture lines, and it is carefully detached from the underlying adipose tissue using a blunt scissor. Entering the underlying muscles may cause a harder to control hemorrhage. After grafting a compress is left in place, and an ice bag is applied to the lower lip to facilitate hemostasis and reduce pain. A hemostatic compress is left in the oral cavity between the dental arch and the lower lip until the afternoon of the day of the intervention. Electrocautery use is not required for hemostasis. The graft is anchored on suture lines, and after preparation it is ready for urethroplasty.

Postoperative care
Immediately after collection of the graft an ice bag is placed on the cheek to prevent hematoma formation and reduce pain. Initially the patient will be on a liquid and cold (ice-cream) diet, then he will continue with semi-liquid diet, and finally he will return to his normal diet. The patient is mobilized from bed in the first postoperative day, and he is typically discharged on the 4th postoperative day. Antialgic medication need is usually minor. The pain is usually manageable with non-steroid anti-inflammatory drugs or Paracetamol. Antibiotic treatment will continue until removal of the urethral or suprapubic catheter.

RESULTS
The oral mucosa graft has been collected from the inferior lip without any incident. After grafting an ice bag was applied. Separate hemostasis sutures were placed in 5 cases.
None of the 15 patients had postoperative bleeding. Normal diet was resumed on the third postoperative day.
The majority of the patients (80%) did not have pain at the time of graft collection. Only 13.3% felt mild discomfort, and there was moderate pain controlled by antialgic medication in 6.66% of the cases. The majority of the patients (93.3%) had no pain (66.6%) or had mild pain (26.6%) and swelling of the lip, which remitted after 2-3 days. The ice bag has been removed on the second day, and oral irrigation with Clorhexidine was continued. Only one patient (6.6%) had moderate pain requiring continuation of antialgic therapy for 7 days after discharge.
In two cases (13.3%) paresthesia of the lower lip occurred, and in one case (6.66%) there was an increased sensibility at the grafting site. These complex cases required collection of a larger graft. Additional hemostasis with suture lines was required as well. There were no cases of oral cavity infections after graft collection.
After one month post-intervention the patients were satisfied, and none of them experienced difficulties during smiling or opening their mouth. There were no cases of “dry mouth” after the intervention.
Out of the total of 15 patients, 11 (73.3%) declared that they would accept another intervention with oral mucosa graft collection (if needed). Only four patients (26.7%) declared that for the time being, they did not want this type of intervention.
The oral mucosa graft collected by this method has been used in seven patients for penile urethroplasty, with the graft placed as ventral onlay (Figs. 1, 2).

![Figure 1. Graft placed as ventral onlay.](image1)

![Figure 2. Graft placed as ventral onlay at the penile-bulbar level.](image2)
In two cases the stricture was localized at the penile-bulbar level. In both cases postoperative results were good, and the patients declared themselves pleased on the PROMs questionnaire.

In five cases the stricture was localized at the middle segment of penis, at about 2-3 cm from the navicular urethra. In three of these cases, the patients were pleased after the intervention, and they did not require other procedures. In the fourth case the intervention was repeated, and dorsal placement graft urethroplasty has been performed. The patient is presently pleased by the result. The fifth patient preferred urethral dilations, and for the moment refused another urethroplasty intervention.

The oral mucosa graft has been used in two cases for penile urethroplasty, with the graft placed as dorsal onlay (Barbagli type). The two patients were satisfied after the intervention, having a satisfactory urine flow according to the PROMs questionnaire. In one case, cystourethrography demonstrated a pseudo-diverticulum of the urethra at the site of grafting, but lacking any clinical or urodynamic significance. (Fig. 3)

The oral mucosa graft has been used in two cases for mid-penile stricture. In two cases recurrence occurred early, after 1-2 months following the intervention. There were two cases where the superior urethral wall was diminished and scarred. The patients refused the second intervention with oral mucosa. In these cases perinostomy has been performed. The patients are presently relatively satisfied, and have voiding comfort.

DISCUSSION

Urethroplasty with oral mucosa is an accepted treatment method in urethral pathology. As a ground rule, graft collection from the cheek or the inferior lip is performed under general anesthesia, and preferably with naso-tracheal intubation in order to keep the oral cavity clear. Collection under local anesthesia is rarely seen in the literature. Initially we were reticent because of our concerns related to patient discomfort. Most of the patients (80%) did not experience pain at the time of collection. Using only lumbar anesthesia the patients started a liquid diet in the evening of the day of the intervention.

Postoperative pain was absent in 66.6% of the cases, and it was mild in 26.6%. Mild pain has been kept under control by minor antalgic medication (paracetamol, anti-inflammatory drugs), and remitted after 2 days of oral irrigation with clorhexidine, and ice applied locally.

Lower lip paresthesia occurred in 13.3% of the cases. In these cases a larger graft was required. After 3 months, only one patient (6.66%) had paresthesia or collection site sensibility. This patient needed a larger graft compared to the standard size, and hemostasis suture lines were also required.
The number of cases is limited, and larger patient populations need to be studied in order to establish the efficiency and morbidity of the method. The collection of the lower lip graft can be performed under local anesthesia. Patients refusing another intervention with oral mucosa graft collected using this method were the ones where urethroplasty failed. Reticence about the method may also be attributed to the failure of reconstructive surgery.

The lower lip graft is thinner than the cheek graft. Urthroplasty using this type of graft is indicated for shorter strictures. Aesthetic aspects of the lower lip, characteristic to each patient are also to be considered. Parodontitis or local lesions may restrict or contraindicate access and collection of an adequate graft.

If collection is performed correctly and preserving anatomical boundaries, lower lip grafting is accepted by patients, and can be used for 3-4 cm long strictures.

Collection under local anesthesia provides the benefit of avoiding general anesthesia with its increased risks to the elderly patient. Intervention costs are lower with local anesthesia and lumbar anesthesia, but sometimes there is not enough material for urethroplasty. Thus, preoperative case selection is essential for a satisfactory outcome.

Concerning the results of urethropleties, the small number of cases cannot provide statistically clear conclusion. Essentially, the aim of the article is to raise the possibility of performing oral mucosa urethroplasty in elderly patients, where general anesthesia is not indicated.

Classification of the penile urethra strictures into distal (close to the navicular fossa), mid-penile (at the penile sheath), and proximal (at the penile-scrotal angle) groups has been performed based on anatomical and surgical reasons.

Ventral onlay type urethroplasty has been more efficient at the penile-bulbar level than in the mid-penile segment. This could be explained by a better developed spongy body in the proximal penile area, which allows for an adequate covering of the oral mucosa graft.

In the mid-penile area the dorsal onlay procedure had a superior success rate compared to the ventral onlay procedure, and the dorsal inlay urethroplasty as well. Dorsal placement provided a better support of the graft compared to the ventral one, and the urethral lumen was more easily augmented than in case of the Asopa procedure, where the thin urethral superior wall did not always allow for sufficient mobilization.

In one case a small pseudo-diverticulum occurred at the site of dorsal onlay grafting, but without any urodynamic consequences.

The Bracka type intervention proved efficient in the distal penile urethra, but required a larger graft, which lead to collection site complications (paresthesia, local sensibility).

CONCLUSIONS

The oral mucosa graft continues to be an excellent and widely accepted material for urethral substitution. Oral mucosa graft collection is a safe procedure, commonly accepted by patients. As a result of careful selection of cases and use of a technique guided by anatomical principles, this procedure provides urethral stricture patients a good quality substitute, without causing deformation and trauma of the genital region, like the penile skin flaps do, and without increasing the surgical trauma, like in case of the bladder mucosa or intestinal submucosa.

Oral mucosa graft collection under local anesthesia from the lower lip is a solution for the elderly patient to avoid general anesthesia. It is better tolerated by the patients, although it does not provide same quality and size substitution material like a cheek graft.

APPENDIX 1

Thank you for completing this questionnaire. The following questions are designed to measure the effect that urethral strictures have on patients’ lives. Some questions may look the same, but each one is different. Please take time to read and answer each question carefully, and tick the box that best describes your symptoms over the past 4 weeks. If you currently have a urethral or suprapubic catheter (a catheter through the lower abdomen) please start from question 10.

1. Is there a delay before you start to urinate?
   - Never
   - Occasionally
   - Sometimes
   - Most of the time
   - All of the time

2. Would you say that the strength of your urinary stream is…
   - Normal
   - Occasionally reduced
   - Sometimes reduced
   - Reduced most of the time
   - Reduced all of the time

3. Do you have to strain to continue urinating?
   - Never
   - Occasionally
   - Sometimes
   - Most of the time
   - All of the time

4. Do you stop and start more than once while you urinate?
   - Never
   - Occasionally
   - Sometimes
   - Most of the time
   - All of the time

5. How often do you feel your bladder has not emptied properly after you have urinated?
   - Never
   - Occasionally
   - Sometimes
6. How often have you had a slight wetting of your pants a few minutes after you had finished urinating and had dressed yourself?
   Never
   Occasionally
   Sometimes
   Most of the time
   All of the time

7. Are you able to prevent the escape of urine if you press your penis, or squeeze it between your legs?
   Yes
   No

8. Overall, how much do your urinary symptoms interfere with your life?
   Not at all
   A little
   Somewhat
   A lot

9. Please ring the number that corresponds with the strength of your urinary stream over the past month.

10. Do you have erections?
    Yes, with normal erectile rigidity
    Yes, with moderately reduced erectile rigidity
    Yes, with severely reduced erectile rigidity
    No

11. Are you able to ejaculate?
    Yes, in normal amounts
    Yes, with moderately reduced quantity
    Yes, with severely reduced quantity
    No

12. Do you experience pain or discomfort during ejaculation?
    Yes, slight pain / discomfort
    Yes, moderate pain / discomfort
    Yes, severe pain / discomfort
    No

13. During erection does the tip of your penis swell like the rest?
    Yes
    No

14. Did you notice tingling or decreased sensation in the penis or scrotum in the last month?
    Yes
    No

15. In general, how much do sexuality related symptoms interfere with your life?
    Not at all
    A little
    Somewhat
    A lot

16. Are you satisfied with the outcome of your operation?
    Yes, very satisfied
    Yes, satisfied
    No, unsatisfied
    No, very unsatisfied

17. If you were unsatisfied or very unsatisfied is that because:
    The urinary condition did not improve
    The urinary condition improved but there was some other problem
    The urinary condition did not improve and there was some other problem as well

18. By placing a tick in one box in each group below, please indicate which statements best describe your own health state today:

   Mobility
   I have no problems in walking about
   I have some problems in walking about
   I am confined to bed

   Self-Care
   I have no problems with self-care
   I have some problems washing or dressing myself
   I am unable to wash or dress myself

   Usual Activities
   (e.g. work, study, housework, family or leisure activities)
   I have no problems with performing my usual activities
   I have some problems with performing my usual activities
   I am unable to perform my usual activities

   Pain/Discomfort
   I have no pain or discomfort
   I have moderate pain or discomfort
   I have extreme pain or discomfort

   Anxiety/Depression
   I am not anxious or depressed
   I am moderately anxious or depressed
   I am extremely anxious or depressed

APPENDIX 2

Complications of buccal mucosa harvesting
Name:
Surname:
Date of birth:
Age at time of surgery:
Date of surgery:
Type of urethroplasty:
- Penile
- Bulbar
Origin of the harvested graft:
- Right cheek
- Left cheek
- Both cheeks
- Lower lip
- Lower lip and cheek
- Primary / Secondary

Early postoperative complications:
1. Have you had troublesome bleeding within 3 days of surgery?
   a. Yes
   b. No

2. How would you assess the pain during surgery?
   a. Absent
   b. Light
   c. Moderate
3. How would you assess the pain within 3 days of surgery?
   a. Absent
   b. Light
   c. Moderate
   d. Severe

4. How would you rate the swelling of your mouth within 3 days of surgery?
   a. Absent
   b. Light
   c. Moderate
   d. Severe

5. After surgery, how long have you resumed normal diet?
   a. After three days
   b. After 6 days
   c. After 10 days

6. What bothered you more after surgery?
   a. Pain in the penis
   b. Pain in the mouth

7. Did you take pain pills within 3 days after harvesting the graft?
   a. Yes
   b. No

Late postoperative complications:
1. How many days did your mouth or lip feel numb after surgery?
   a. 1 week
   b. 1 month
   c. 3 months

2. How would you rate the lip numbness due to scarring?
   a. Absent
   b. Light
   c. Moderate
   d. Severe

3. Have you had an oral (mouth) infection after surgery?
   a. Yes
   b. No

4. After the operation have you noticed any alteration in sensitivity or perception of the lips?
   a. Numbness
   b. Pain
   c. I do not feel anything

5. A few months after the operation have you noticed that you have trouble opening your mouth?
   a. No
   b. Light
   c. Moderate
   d. Severe

6. Have you noticed a few months after the operation that you have trouble smiling?
   a. No
   b. Light
   c. Moderate
   d. Severe

7. Have you noticed a few months after the operation that you have dry mouth?
   a. No

b. Light
   c. Moderate
   d. Severe

8. Have you noticed a few months after surgery that your mouth swells after you eat?
   a. No
   b. Light
   c. Moderate
   d. Severe

9. You have resumed your normal diet after surgery?
   a. Yes
   b. No

10. How much time has passed after surgery until you returned to your normal diet?
    a. Up to 1 month
    b. 2 months
    c. 3 months

11. Would you accept another oral mucosa harvesting intervention?
    a. Yes
    b. No

REFERENCES


