

X. Summary

Introduction

The contemporary trends in medicine are directed to less invasive examinations and treatment approaches. The aim of the study is to determine the application possibility of Pelvicol™ collagen acellular matrix implant in reconstructive surgery of severe urethral strictures and to verify the role of extraluminal sonography as an alternative investigation of urethral stenosis indicated to surgical solving.

After endoscopy failure the next step of the therapy is open surgery. The resection of the urethral wall and end-to-end anastomosis of spatulated sides is used only in short defects of bulbar urethra. The longer urethral strictures are acceptable for urethral wall substitution technique, side-to-side anastomosis of urethral base and substitution graft or flap. The combination of urethral wall resection and substitution is the eventuality for extensive urethral injuries. The most useful substitution material for urethral reconstruction is buccal mucosa graft. Severe mouth pain in patch removal location and patient starving are the great disadvantages of the way. So we expected the Pelvicol™ collagen implant using in 20 patients for urethral wall reconstructive substitution during two year's period. We supposed the significant operation time shortening, increasing patient's comfort after the procedure and optimal implant recover by acceptor's tissue reepitalization and vascularization. Monitored group was measured before and after the reconstruction by extraluminal ultrasonography, ureterocystography and uroflowmetry.

The aims of the study

1. To compare the long-term results of anastomotic bulbar urethroplasty and on-lay substitution reconstructions using autogenic tissues (buccal mucosa graft, preputial skin flap, or dorsal penile skin flap)
2. To adopt the new method of extraluminal ultrasonography as a standard evaluation of urethral stricture disease and analyze its benefit for clinical practice
3. To verify the utilization possibility of heterogenic acellular collagen implant Pelvicol™ in reconstructive on-lay urethral surgery and implementation the new procedure for clinical practice
4. To valorize the results of urethral replacement using heterogenic collagen implant Pelvicol™ and compare its results with those on-lay repairs utilizing autogenic tissues

Conclusion and utilization for clinical practice

1. The long term results comparison between anastomotic and substitution technique using autologous tissue grafts displays the following facts:

- **end-to-end anastomotic urethroplasty** is suitable only for repair of short bulbous urethral strictures with maximum length from 15 to 20 mm
- easy operation technique with excellent final success rate 92,8%
- minimum early (21,6%) and late (7,2%) complications rate
- the possibility of perioperative and reoperative modification to substitution technique
- excellent cosmetic outcome of the procedure
- material and economic unpretentiousness
- **disadvantage** of the method is the length and localization limit for only use in bulbar urethra regarding to anatomy proportion

substitution on-lay urethroplasty using own tissue materials is:

- competent method in extensive and multiple anterior urethral defects treatment with total success rate 84,6%
- the best experience with buccal mucosa grafts in penile and penobulbar localization
- the best results in congenital etiology of the stricture and in length from 3 to 7 cm
- the higher late complication rate 46%, but the necessity of reoperation rate only in 15,4 % cases
- materials availability
- economic unpretentiousness
- repeatable procedure
- **disadvantage** is elongation of operation time during withdrawal the tissue for reconstruction and strong hurtfulness of the denuded surface especially in buccal area

2. The stricture length acquired by UCG answer to reality in 3 cases (15%), sonourethrography measurements were in agree with surgical findings in 16 (80%) patients. Sonography nor urethrography miscarried the length of urethral wall fibrosis localized close behind fossa navicularis in one (5%).

Routine used UCG displays only longitudinal irregularity of luminal outline in contrast contents. Extraluminal sonography is able to determine the range and degree of

urethral and periurethral tissue spongiofibrosis with significantly higher accuracy. On this account can be extraluminal sonography recommended as a standard to establish objective criteria for reconstructive urethral surgery selection.

3. From October 2003 we're initiated to use heterologous acellular collagen matrix Pelvicol™ in reconstructive on-lay surgery of urethral strictures. We're responded on actual literature items detailing more frequent experimental, but also clinical using of these materials for wide surgery practice. Regarding to achieved results, seen below, we're so extended the possibilities of urethral surgical repair, before the mentioned time solved only by the bulbous resection and end-to-end anastomotic or on-lay substitution techniques using autologous tissue grafts or flaps. This new method was put into the clinical practice.

4. In results comparison between both groups of substitution urethroplasties for clinical set using Pelvicol™ follows:

- difference of final success rate about 14,6% as a detriment of the method
- re-operation rate for stricture recurrence in 30% cases
- comparable results in according to localization, etiology and stricture lenght to the group of urethral repairs using autogenic materials
- reduced operating time and pooperative patient's comfort improvement at higher financial heftiness
- there is no statistically significant difference between results of both compared sets ($p=0,292$)

According to our experience and results we can recommend the use of heterologous collagen Pelvicol™ implant as a safe and promissing approach for the repair of multiple and severe long urethral strictures.