MP42-18

ROBOT-ASSISTED VESICO-VAGINAL FISTULA REPAIR: COMPARISON OF THE EXTRAVESICAL AND TRANSVESICAL TECHNIQUES

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INTRODUCTION AND OBJECTIVE: Robotic vesico-vaginal fistula repair (R-VVF) was described in 2004 with the aim to minimize the morbidity of the abdominal VVF repair. Almost two decades later, the literature on r-VVF remains scant. The objective of this study was to evaluate the results of R-VVF repaisr and to report complications.

METHODS: The charts of all female patients who underwent a R-VVF from March 2007 to December 2021 at four academic institutions were reviewed retrospectively. All surgeons involved had already a robust robotic surgery experience at the beginning experience (>50 cases) but limited experience with VVF repair. All abdominal VVF repair over the study period were performed using a robotic approach. All centers used a vaginal approach in case of easily accessible vaginal fistulous orifice. The decision to use a vaginal or an abdominal approach was not standardized across centers and left at the surgeons' discretion. The patients' characteristics, the surgical technique details (iflap interposition vs. not, transvesical versus extravesical approach, excision of fistulous tract vs not) and peri-operative outcomes were recorded. The success of VVF-R was defined as the absence of clinical recurrence. The outcomes of the extravesical vs transvesical techniques were compared.

RESULTS: Twenty-two patients were included over the study period. The median age was 43 years (IQR 38-50). The causes of VVF-R were either post-surgical (77.3%), post-obstetrical (18.2%) or post-trauma (4.5%). Fistulas were supratrigonal and trigonal in 18 and 4 cases respectively. The fistulous tract was systematically excised and an interposition flap was used all but two cases (90.9%%). The transvesical and extravesical techniques were used in 13 and 9 cases respectively. The patient andfistula's characteristics are presented in Table 1. There were more supratrigonal fistula in the extravesical group (100% vs. 69.2%; p=0.11). One intraoperative complication occurred in the extravesical group: an ureteral injury which was immediately sutured (11.1% vs. 0%; p=0.41). The operative time tended to be shorter in the extravesical group (179 vs. 229 minutes; p=0.13). There were only three postoperative complications, all minor: one gross hematuria in the extravesical group (Clavien grade 1), one hematoma requiring blood transfusion and one pyelonephritis in the transvesical group (both Clavien grade 2) (11.1% vs. 15.4%; p=0.99). The length f hospital stay did not differ significantly between the to groups (5.1 vs. 4.1 dys; p=0.56). None of the patients had vesico-vaginal fistula recurrence after a median follow-up of 14 months (IQR 3-21).

CONCLUSIONS: The present series, one of the largest R-VVF reported to date, is consistent with the few series already published with a 100% cure rate and excellent perioperative outcomes. Systematic excision of the fistulous tract and the high rate of flap interposition may explain the high success rate. The transvesical and extravesical approach yielded similar outcomes but the transvesical approach may allow to treat more complex fistulas (e.g. infratrigonal).

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MP42-19

BILAYERED AUTOLOGOUS ADIPOSE-DERIVED MESENCHYMAL CELL-GELATIN SHEETS RECONSTRUCT URETERAL TISSUES IN RABBITS

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INTRODUCTION AND OBJECTIVE: Treatments of ureteral defects or strictures due to disease or trauma require reconstruction by urological surgery. However, those surgeries have some limitations, such as reoperation, or depending on ureteral length. Tissue engineering techniques would provide novel approaches to avoid the limitations. In this study, we fabricated bilayered autologous adipose-derived mesenchymal cell (AMC)-gelatin sheets and transplanted them into rabbits to replace surgically excised ureteral segments.

METHODS: AMCs harvested from abdominal adipose tissues of female New Zealand White rabbits were cultured on collagen-coated dishes and labeled with a red fluorescent dye, PKH26, for later identification. Monolayers of AMCs that were cultured on temperature-responsive dishes were harvested by a gelatin hydrogel sheet. Two AMC-gelatin sheets were then overlaid together with the cell sides juxtaposed, forming a bilayered AMC-gelatin sheet. Following each partial ureterectomy of approximately 1 cm, the bilayered autologous AMC-gelatin sheet was transplanted, joining the proximal and distal ends of the remaining the ureter (experimental group; n=9). Control animals were conducted with a bilayered acellular-gelatin sheet (control group; n=9).

RESULTS: At 4 and 8 weeks after transplantation, the proximal regions of ureters of control groups exhibited flexures and dilations compared with experimental groups. Both the control and experimental reconstructed ureteral walls had smooth muscle layers; however, those in the experimental reconstructed ureteral walls were significantly thicker and better organized than those in the control groups. In addition, the lumina of the 8-week reconstructed ureteral tissues in experimental groups did not show histological strictures as seen in the control ureters. Some AMCs differentiated into smooth muscle marker-positive cells. The experimental ureteral walls contained smooth muscle cells derived from the PKH26-labeled AMCs and others that were derived through migration and differentiation of cells from the remaining proximal and distal ends of the original ureter.

CONCLUSIONS: These results indicated that the bilayered AMC-gelatin sheets could replace and/or reconstruct ureter tissues.

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TO SEAL OR NOT TO SEAL: EXAMINING THE ROLE OF TISSUE ADHESIVES FOR BLADDER AND URETERAL RECONSTRUCTION

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INTRODUCTION AND OBJECTIVE: While surgical adhesives may be FDA approved as adjunct hemostatic agents or sealants, application is typically off-label for urinary tract tissue. Current literature lacks consensus regarding the role of tissue adhesives for bladder and ureteral reconstruction. This systematic review synthesizes clinical and animal data across key adhesives that have been applied to bladder and ureteral tissue, assessing trade-offs between competing parameters affecting agent selection and effectiveness.

METHODS: A literature search was conducted in Pubmed, Web of Science, Embase, and Cochrane databases to identify articles published from 2000-2021 that reported urologic reconstruction and the use of adhesive, hemostatic agents, and/or sealants. Figure 1A illustrates identification and inclusion/exclusion criteria.

RESULTS: 29 publications were included (18 human, 11 animal; Figure 1B). Fibrin sealant was the most commonly evaluated adhesive, followed by cyanoacrylate and bovine serum/albumin/glutaraldehyde (bioglue). Clinically, all three adhesive types effectively managed fistulas, with significant decrease in operative time, decrease

blood loss, and resolution of urinary leakage. When comparing acute inflammatory and wound healing responses, cyanoacrylate demonstrated higher cytotoxicity in comparison to fibrin sealant. No significant inflammation at 1 week (in comparison to sutured closures) occurred following bioglue application. In prior characterization studies, cyanoacrylate had the strongest tensile strength and adhesive parameters; however, no study assessed mechanical or adhesive parameters of fibrin sealants or bioglues in bladder or ureteral tissue.

CONCLUSIONS: This systemic review provides overall low-level evidence for the application of the three major adhesive types to bladder and ureteral reconstruction as a suture reinforcement. However, these three adhesive types are not equivalent, demonstrating trade-offs between adhesive strength and cytotoxicity. Future research is needed to assess comparative parameters of all three major adhesives, including mechanical and adhesive benchtop testing, effects on wound healing, and long-term outcomes of clinical application to bladder and ureteral tissue.

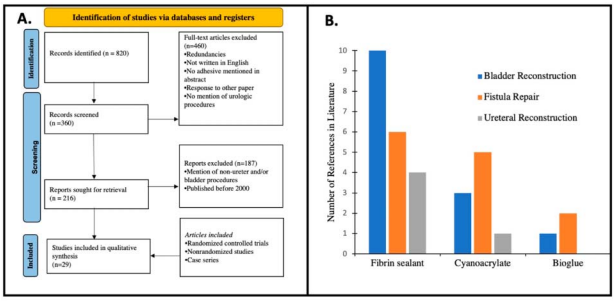

Figure 1. (A) Study selection using Preferred Reporting Items for Systematic Review and Meta-Analysis (PRIMSA) flow diagram. (B) Successful Implementation of adhesives in bladder and ureteral tissue

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