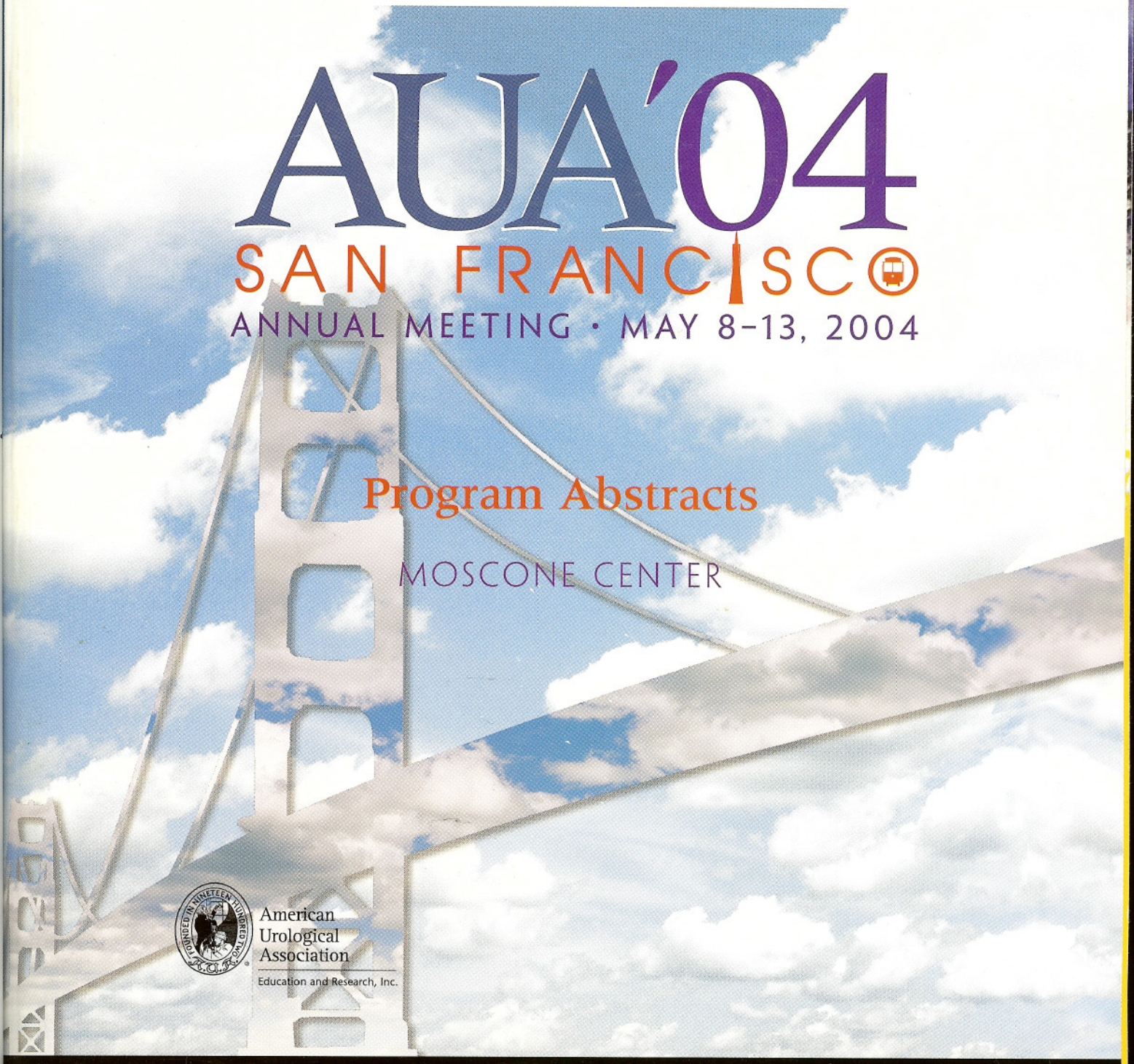
Volume 171 April 2004 Number 4

The Journal of UROLOGY®

Official Journal of the American Urological Association
Founded In 1917 By Hugh Hampton Young



AUA'04

SAN FRANCISCO

ANNUAL MEETING · MAY 8–13, 2004

Program Abstracts

MOSCONE CENTER

American Urological Association
Education and Research, Inc.

Supplement to *The Journal of Urology®*

closely, we identified a number of genes that are commonly up-regulated in both tumors including *insulin-like growth factor 2*, *thrombospondin 4*, and *mesenchyme homeo box 1*. We also identified a set of genes that distinguish mesoblastic nephroma from Wilms tumor, some of which may underlie the difference in their behaviors and can be used as diagnostic markers. Among this group of genes, *topoisomerase II-α (Topo IIα)* is highly expressed in Wilms tumors, but not over-expressed in mesoblastic nephroma. Immunohistochemical staining of *Topo IIα* in additional cases of Wilms tumors and mesoblastic nephromas further confirms this distinction.

CONCLUSIONS: We conclude that mesoblastic nephroma has a distinct gene expression profile and that some of the newly identified genes can be potentially used as novel diagnostic markers.

Source of Funding: None

539

IS THE ARTIFICIAL URINARY SPHINCTER IDEAL FOR EPISPADIAS INCONTINENCE?

C D Anthony Herndon, Birmingham, AL; Richard C Rink, Tyler E Emley, Indianapolis, IN; David B Joseph, Birmingham, AL; Phillip Nasrallah, Akron, OH*

INTRODUCTION AND OBJECTIVE: The artificial urinary sphincter is a bladder neck procedure that achieves dryness in most patients, allows spontaneous voiding and does not encroach on bladder capacity. We reviewed a multi-institutional experience with the use of the AUS as the sole treatment of incontinence secondary to isolated epispadias.

METHODS: A retrospective review was performed from 1987-2003 at three medical centers identified 6 patients(5 male, 1 female) with isolated epispadias that had no bladder neck procedures performed prior to placement of an AUS. Average age at AUS insertion was 6.7 (4-11) yrs The 800 series AUS was used and placed at the bladder neck in all cases. Outcome measures included: procedures performed after placement of the AUS, method of bladder emptying, continence (partial 1-3 hrs, complete > 3 hrs), mechanical and surgical complications associated with the AUS.

RESULTS: Mean follow-up is 4.7 (.4-16) yrs. Complete continence was obtained in 5 patients with 1 patient improved but partial dryness. After placement of the AUS, 5 patients continue to void while 1 girl requires clean intermittent catheterization. No mechanical or surgical complications related to the AUS have occurred. Two males report normal ejaculation. Two patients have required multiple revisions of urethral fistulae related to the epispadias repair.

CONCLUSIONS: The AUS appears to be an ideal candidate for the initial treatment of incontinence from isolated epispadias. It achieves continence in most patients, allows spontaneous voiding and appears to permit ejaculation.

Source of Funding: None

540

A NOVEL COMPOSITE SCAFFOLD PROMOTES THE FORMATION OF NORMAL BLADDER TISSUE

Yoshio Hori, Boston, MA; Luiz Freitas, James J Yoo, Anthony Atala, Boston, MA*

INTRODUCTION AND OBJECTIVE: Several types of biomaterials (artificial and naturally derived) have been used either with or without cells for bladder augmentation, however, each type has desirable traits which were exclusive of the other. The ideal biomaterial for bladder augmentation should be elastic, like naturally derived matrices, and porous, like artificial matrices. In this study we designed and fabricated a novel composite scaffold and tested its potential for the engineering of bladder tissue.

METHODS: The composite scaffolds were fabricated by bonding a naturally-derived collagen-based acellular matrix to polyglycolic acid polymers with threaded collagen fiber stitches. The two-layered composite scaffolds were heat reinforced at 200°C for 80 minutes, followed by lyophilization and sterilization. Normal human bladder cells were seeded on the composite scaffolds. Biocompatibility, physical and biomechanical characteristics of the scaffolds were evaluated. The cell-seeded scaffolds were implanted in vivo for the assessment of tissue formation.

RESULTS: The bladder cells readily attached and proliferated on the composite scaffolds and formed bladder tissue structures in vivo, as confirmed histologically, by immunohistochemistry and Western blots. The scaffolds possessed a similar porosity index as native bladder and were watertight. The biomechanical studies demonstrated that the tissues were readily elastic while maintaining their pre-configured structures.

CONCLUSIONS: This is the first demonstration in the field where a composite scaffold structure is fabricated with two completely different polymer systems for tissue reconstitution. These novel scaffolds are biocompatible and possess ideal physical characteristics for the engineering of bladder tissue. This scaffold system may be useful in the future in patients requiring bladder augmentation.

Source of Funding: Departmental

*Presenting author.

541

BUCCAL MUCOSA GRAFT URETHROPLASTY: TEN YEAR OF LIP SERVICE AT THE UNIVERSITY OF MICHIGAN

Cole P Nelson, John M Park, Ann Arbor, MI; Harry P Koo, Richmond, VA; David A Bloom, Ann Arbor, MI*

INTRODUCTION AND OBJECTIVE: Since its introduction over 10 years ago, the buccal mucosa graft become a popular tool, but long-term outcome data are sparse. The aim of this study is to report our series of patients who underwent buccal graft urethroplasty for hypospadias, and to identify preoperative and operative factors associated with post-operative complications.

METHODS: We retrospectively reviewed medical records to obtain clinical data for 66 patients who underwent 69 urethroplasty procedures between 1992 and 2003, performed by 3 surgeons. Median age was 3.7 years, although 6 patients were over 30. Median follow-up was 25 months. Analyses were performed to identify factors associated with surgical complications. Urethral complications were defined as post-operative fistula, meatal stenosis, or urethral stricture requiring procedure.

RESULTS: Prior urethral repair had been done in 52% of patients, while 38% had prior first stage repair (chordee release). Only 5 patients (7%) had no prior penile or urethral surgery. Mean graft length was 4.2 cm. Tube graft was used in 19%, onlay graft in 81%. Mean length of stay was 2.0 days, mean catheter time was 13.6 days. Buccal graft urthroplasty was successful (without requiring secondary procedures) in 48% of patients. Complications included fistula in 16%, meatal stenosis in 14%, stricture in 12%, meatal stenosis and stricture in 7%, and other combinations in 3%. There was no urethral diverticulum. Most urethral complications were easily managed with simple procedures. Oral complications were very uncommon, and included slight asymmetry and mild numbness. Factors associated with post-operative complications included tube vs. onlay graft ($p=0.009$) and prior penile/urethral surgery ($p=0.015$). There were no complications in patients with no history of prior surgery. No association was detected for patient age, graft length, catheter time, surgeon, or existence of pre-operative fistula.

CONCLUSIONS: Our data indicate that the buccal mucosa grafts are useful for difficult primary repair as well as complex revisions. A significant number of patients will require further procedures, although many of these procedures are minor. The risk of urethral complications is higher for tube grafts compared with onlay grafts. Oral graft donor site complications are minimal. The low incidence of complications in patients with no prior surgery suggests that outcomes may be better for buccal repair as a primary procedure.

Source of Funding: None

542

AUGMENTATION CYSTOPLASTY WITH ACELLULAR DERMIS

Elizabeth Yerkes, C Subah Packer, Tomalyn Johnson, Mary Davis, Mark P Cain, Anthony Casale, Richard C Rink, Martin Kaefer, Indianapolis, IN*

INTRODUCTION AND OBJECTIVE: Bladder outlet obstruction can lead to bladder wall thickening and inability to effectively store urine at low pressures. Complications inherent to enterocystoplasty (e.g. electrolyte abnormalities) led to the search for alternative materials such as engineered tissues. Results of a previous study in a murine model suggested that human acellular dermis might be an excellent scaffold for regeneration of full thickness bladder tissue. Questions regarding homogeneity of regenerated tissue across the scaffold patch were raised in this xenograft model. In the present study, the ability of acellular dermal matrix to homegeneously direct bladder wall regeneration in an allogeneic, large animal model was assessed.

METHODS: Eight swine underwent excision of a 3x3 cm bladder wall segment and subsequent augmentation with a 3x3 cm patch of porcine acellular dermal matrix (LifeCell Corp). Videourodynamics were performed prior to sacrifice at 3 months. Tissue strips from the suture line edge, mid-way from the edge to the center, and from the center of the patch were tested for compliance and for contractility using electrical field stimulation (EFS). Histological sections were evaluated for neovascularization and maturity of bladder wall components.

RESULTS: All animals survived the length of the experiment without bladder related complications. Urodynamics of augmented animals compared favorably with controls. Patch area decreased (retracted) an average of 25% over the course of the 3 month study. Strips from all regions of the patch including the center responded to EFS with contractile force that ranged from 45-66% of control values. Optimal resting tensions were not different between suture line, mid-patch, center-patch and control strips suggesting that stiffness in all regions of the regenerated patch was similar to that of control tissue. Regeneration of all tissue layers (mucosa, muscularis and serosa) was clearly evident.

CONCLUSIONS: Acellular dermal matrix provides an allograft with structural integrity that supports homogeneous regeneration of bladder tissues with physiological functions necessary in successful bladder augmentation that is devoid of undesirable characteristics inherent in using other tissue types.