Title

PD29-05 THE EFFECT OF BIKE SEAT MODELS ON PERINEAL PRESSURE DURING CYCLING: IMPLICATIONS FOR PATIENTS AFTER URETHRAL SURGERY

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INTRODUCTION AND OBJECTIVE: Some healthcare systems have set up referral trauma center to centralize expertise to improve trauma management. There is scant and controversial evidence regarding the impact of provider's volume on the outcomes of trauma management. The aim of our study was to evaluate the impact of hospital volume on the outcomes of renal trauma management in a European healthcare system.

METHODS: A retrospective multicenter study was conducted, including all patients admitted for renal trauma in 17 hospitals between 2005 and 2015. To evaluate the impact of HV we divided patients into four quartiles according to the caseload per year: low volume ($\leq$8/year), moderate volume (9-13/year), high volume (14-25/year), and very high volume ($\geq$26/year). The primary endpoint was failure of non-operative management defined as any interventional radiology (IR) or surgical procedure needed within the first 30 days after admission.

RESULTS: Of 1771 patients with renal trauma, 1704 were included. There were significantly more non-operative managements in the very high and low volume centers (84.6% vs. 76.9% vs. 78.5% vs. 81.6%; p = 0.02). Early follow-up imaging was used more commonly in lower volume centers (86.1% vs. 83.9% vs. 73.8% vs. 81%; p = 0.0007). In univariate logistic regression analysis, very high hospital volume was significantly associated with a lower risk of non-operative management failure when compared to low (OR = 0.54; p = 0.05) and moderate hospital volume (OR = 0.48; p = 0.02). There were significantly less nephrectomies in the high and very high volume groups (0.9% and 0.5% vs. 1.9% and 3.5%; p = 0.003). In multivariate analysis very high volume remained significantly associated with a lower risk of non-operative management failure compared to low (OR = 0.48; p = 0.04) and moderate volume (OR = 0.42; p = 0.01).

CONCLUSIONS: In this multicenter study, the management of renal trauma varied significantly according to hospital volume. There were lower rates of nephrectomy and failure of non-operative management in very high volume centers. These results raise the question of centralizing the management of renal trauma patients which is currently not the case in our healthcare system.

Source of Funding: None

PD29-04

COMPARISON OF STRICTURE CHARACTERISTICS AND URETHROPLASTY SUCCESS RATES CAUSED BY EXTERNAL VERSUS INTERNAL URETHRAL TRAUMA

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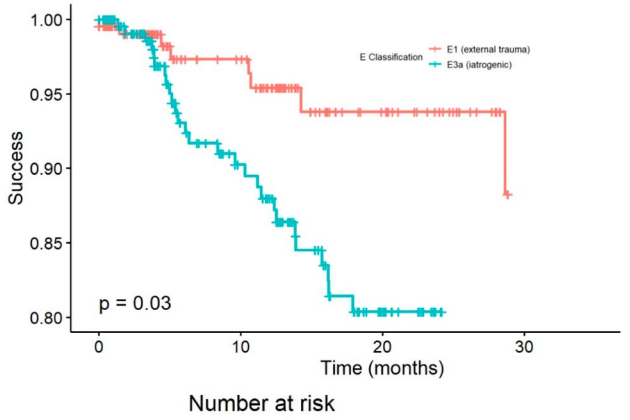
INTRODUCTION AND OBJECTIVE: Trauma is a commonly listed etiology for anterior urethral stricture disease (aUSD). Trauma can be the result of external (e.g. straddle injury) or internal trauma (e.g. TURP injury). Herein we compare the differences in stricture and urethroplasty characteristics between the two, hypothesizing that the differences in stricture development mechanism will portend different surgical outcomes.

METHODS: The Trauma and Urologic Reconstruction Network of Surgeons (TURNS) prospective database was used to develop a cohort of external urethral trauma (E1) and internal urethral trauma (E3a) aUSD. Stricture and repair variables were compared between cohorts using descriptive statistics. Longitudinal outcomes were compared using Kaplan Meier time to event analysis.

RESULTS: Of the 2137 aUSD in the TURNS database, 282 (13.2%) were E1 and 287 (13.4%) were E3a. Mean stricture lengths between E1 (3.1 $\pm$ 2.6) and E3a (3.9 $\pm$ 3.1) differed significantly (p $<$0.001). The vast majority of E1 strictures were located in the bulbar urethra (89%; Proximal bulb (S1a), 73%; Distal bulb (S1b), 16%) versus only 52% of S3a strictures (37% S1a; 16% S1b) (p $<$ 0.001). The overall urethroplasty success rate for E1 strictures was 84% varying significantly by location (S1a 89% v. Penoscrotal (S2a) 60%; p $<$ 0.001), the majority being amenable to excisional repairs (51%). This differed significantly from E3a (p $<$ 0.001) urethroplasty success (overall 77%; S1a 78% v. S2a 71%; p $<$ 0.001), the majority requiring substitutional repairs (75%). The Figure reveals significant early separation of urethroplasty success over time (p = 0.03) with a median time to failure for E3a strictures being $<$ 6 months.

CONCLUSIONS: Traumatic strictures are common, constituting over 25% of all aUSD in the TURNS urethroplasty database. However, the mechanism of injury, whether from external trauma (which generally results in a well-defined area of disease) versus internal trauma (which is often the result of ischemia with disease extent that is less certain/defined) leads to different stricture locations and lengths, thereby significantly affecting surgical outcomes. The ischemic nature of strictures from internal trauma, and early failure rates, should alert surgeons to the possibility of disease extending beyond the visible stricture, and of an unreliable local blood supply when supporting grafts.

Figure: Longitudinal Time-to-event (anatomic recurrence) Analysis comparing E1 (external trauma) to E3a (internal trauma) anterior urethral strictures



Source of Funding: NIDDK 1R21DK115945-01

PD29-05

THE EFFECT OF BIKE SEAT MODELS ON PERINEAL PRESSURE DURING CYCLING: IMPLICATIONS FOR PATIENTS AFTER URETHRAL SURGERY

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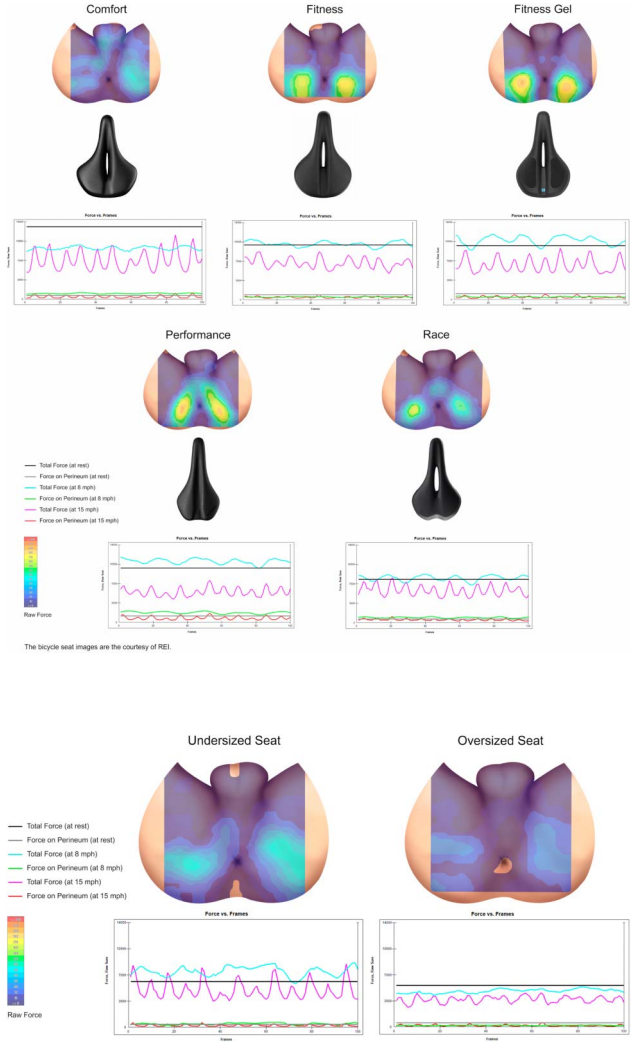
INTRODUCTION AND OBJECTIVE: The impact of perineal pressure and microtrauma amongst avid cyclists have been associated with sexual and urinary dysfunction, including urethral stricture disease. Following a period of perineal rest after urethral surgery, active cyclists seeking to return to this recreation search for guidance to reduce their risk for complications. Our objective was to determine which bicycle seat best shields the perineum and protects this sensitive area to recurrent trauma.

METHODS: We tested five seats (Bontrager, Waterloo, WI) with varying levels of padding and morphology (comfort, fitness, fitness gel, performance, and race) for two different riders. We also tested undersized and oversized seats. The seats were installed on a Peloton® stationary exercise bike (New York City, NY). Force measurements were performed using a 9833E-50 Large F-Socket Sensor and its dedicated software (Tekscan, South Boston, MA). The bicycle was adjusted to ensure that the two cyclists had standardized torso and knee angles. We measured total and perineal forces in three conditions at the same resistance: a. at rest (not pedaling); b. at 8 mph; c. at 15

mph. We reviewed the heatmaps and used a standardized method to identify the perineal area using the ischial tuberosity landmarks.

RESULTS: There was significant differences in terms of perineal force across bicycle seats ($p < 0.001$) with fitness gel seats having the lowest forces in both sizes (Fig. 1). In all measurements perineal forces were significantly lower at 15 mph compared to 8 mph ($p < 0.001$), except for the large size of performance seat ($p = 0.18$). The oversized seat exerted less force on perineum compared to the undersized seat at both 8 mph ($p < 0.001$) and 15 mph ($p < 0.001$) speeds (Fig. 2).

CONCLUSIONS: Racing bicycle seats exert more force on the perineum. Larger seats absorb a greater total force and act to distribute the subject's weight thereby delivering less force to the perineum. More perineal pressure is delivered at lower speeds and at rest due to the need for the cyclist to lift off the seat during times of strenuous activity.



Source of Funding: None

PD29-06
AN ANALYSIS OF COMBAT-RELATED UROLOGIC INJURIES

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INTRODUCTION AND OBJECTIVE: Genitourinary (GU) trauma is an underrepresented injury pattern of conflicts in the 21st century. GU injuries have previously occurred at a rate of 2-5% in pre-9/11 era military operations. In 2001-2013, GU injuries sustained during the conflicts of Iraq and Afghanistan occurred in approximately 13% of all combat casualties, as compared to 2-5% traditionally seen in previous wars or conflicts of the United States. Previous wars' GU injuries were largely dominated by renal injuries, whereas now, we largely see complex combat wounding patterns suffered by the external genitalia. IEDs accounted for up to 89% of GU injuries during this timeframe.Until now, there has been little to no literature published on combat-related GU injuries beyond the year 2013. We sought to describe the incidence of combat-related genitourinary injuries and interventions from 01 January 2007 to 17 March 2020.

METHODS: This is a secondary analysis of a previously described dataset from the Department of Defense Trauma Registry (DODTR). Within our dataset we used predefined search criteria to identify casualties with urological-based injuries and interventions to the kidneys, ureters, bladder, and reproductive organs.

RESULTS: Within our dataset there were 25897 adult casualties. Within that, 8% sustained a urological injury. The median age was 25. US forces comprised the largest proportion (41%) with battle injuries predominating (92%). Explosive (69%) followed by firearm (29%). The median injury severity score was 20 (IQR 13-29). Most survived to hospital discharge (92%). The most frequently injured organs were the scrotum (54%), followed by the testes (48%), followed by the penis (27%) and kidneys (27%).

CONCLUSIONS: Explosives remain the leading cause of combat-related GU injuries in the modern era. The most common injury sites were the scrotum and testes. The most common genitourinary organ injured was the kidney. Our findings help inform predeployment training needs for surgeons.

Table 1: Demographics

		Urologic Injury n=2073	No Urologic Injury n=23824
	Age	25 (21-30)	25 (21-30)
	Male	98% (2038)	97% (23184)
	US Military	41% (848)	39% (9334)
	NATO Forces	8% (183)	8% (1903)
	Partner Force	26% (543)	27% (6502)
	Humanitarian	24% (499)	25% (6085)
	Battle injury	92% (1916)	79% (18924)
	Nonbattle injury	8% (157)	21% (4900)
Mechanism of injury	Explosive	69% (1446)	51% (12318)
	Firearm	24% (504)	29% (7019)
	Motor vehicle collision	3% (67)	7% (1706)
	Other	2% (56)	12% (2781)
Injury Severity Score	Composite	20 (13-29)	6 (2-14)
Serious injuries by body region	Head/neck	13% (272)	13% (3144)
	Face	<1% (13)	<1% (101)
	Thorax	21% (434)	10% (2427)
	Abdomen	35% (727)	5% (1233)
	Extremities	58% (1202)	23% (5433)
	Skin	4% (90)	2% (492)
Outcome	Survival to discharge	92% (1914)	96% (22843)

Table 2: Injuries documented of those with urological injuries (total n=2073)

Adrenal	2% (50)
Bladder	15% (324)
Penis	27% (563)
Ovary/ovarian/fallopian	<1% (3)
Uterus	<1% (5)
Perineum	12% (241)
Prostate	1% (21)
Ureter	3% (58)
Renal/Kidney	27% (553)
Scrotum	54% (1121)
Testes	48% (1000)
Vulva/vagina	<1% (5)

Source of Funding: We received no funding for this study

PD29-07
THE MANAGEMENT AND OUTCOMES OF VESICOVAGINAL FISTULA REPAIR

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INTRODUCTION AND OBJECTIVE: Vaginal and abdominal approaches are used to attempt VVF closure but, due to a paucity of