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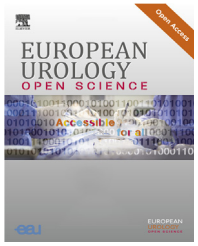

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Open Horizon – Editorial

Exploring the Function of the Anterior Fibromuscular Stroma in Passive Continence

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Urinary continence, a fundamental aspect of human health and wellbeing, has been a topic of intense study and debate in the field of urology. The urethral sphincter complex (USC), particularly the lissosphincter and rhabdosphincter components, plays a pivotal role in this vital function. Koraitim [1] highlighted the significance of the lissosphincter in maintaining urinary control at rest and the rhabdosphincter during conditions of elevated abdominal pressure. This distinction allowed a deeper understanding of the intricacies of continence.

The traditional view of passive continence, which heavily relies on striated muscles as revealed by Yalla et al [2], underwent a significant shift with the introduction of the USC concept by Yucel and Baskin [3], especially in relation to the male anatomy. Intriguingly, Lapide et al [4] demonstrated that even when skeletal muscle flaccidity was induced by muscle relaxants, resulting in paralysis of the external sphincter, patients did not experience urinary incontinence (UI). They were still capable of initiating voiding, albeit with prolonged interruption of the urine stream. This revelation was groundbreaking and suggested a more intricate interaction of various factors in the mechanisms responsible for urinary control.

Insights gained from work by Krahn and Morales [5] further complicated the conventional understanding. They observed that patients who underwent surgeries such as transurethral resection of the prostate (TURP) and open prostatectomy, even with bilateral pudendal nerve paralysis, were able to initiate voiding without experiencing incontinence. This observation suggested that the integrity of muscle and elastic tissue after removal of the prostate gland might not be as crucial to continence as previously thought.

A critical observation is the effect of the prostate surgery on the USC, particularly during prostate enucleation, which is more comprehensive than TURP. Disruption of the lissosphincter during surgery would theoretically lead to loss of resting resistance, a key component of passive continence. However, this anticipated severe UI is not a typical postoperative outcome, contradicting the previously established models of continence.

The introduction of endoscopic enucleation of the prostate (EEP) marked a significant change in surgical approaches and outcomes, particularly for UI rates. In comparison to TURP, the UI incidence is notably higher after EEP, although most cases tend to resolve within 3 mo. This unpredictability regarding UI occurrence and the time to recovery is a considerable concern among enucleation surgeons and patients.

In response to these challenges, surgeons have developed innovations and refined various surgical techniques, each with distinct names and subtle variations in detail. However, the techniques all converge on a shared objective: protection and preservation of the anterior aspect of the prostate. Pioneering methods such as the anteroposterior dissection approach of Endo et al [6] for holmium laser enucleation of the prostate (HoLEP) have significantly reduced stress UI rates after surgery. This breakthrough was followed by other techniques, including Omega-symbol HoLEP, en bloc HoLEP [7], top-down HoLEP, and enucleation with preservation of the anterior fibromuscular stroma (AFS) [8]. These methods, despite their diverse nomenclature and slight differences, share an overarching strategy of preservation of the anterior prostate.

The often overlooked role of the AFS can inadvertently lead to damage during TURP and EEP procedures,

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contributing to the unexpectedly high incidence and unpredictable duration of UI after EEP. This oversight highlights the need for a paradigm shift in the approach to these procedures.

The AFS, in contrast to the previously emphasized circular lissosphincter, has emerged as a crucial element in passive continence. Research such as the study by Ukimura et al [9] has demonstrated the vital role of the AFS in voiding initiation. AFS contraction facilitates opening of the bladder neck, an essential anatomic and functional aspect of continence. Damage to the AFS can result in continuous opening of the bladder neck, leading to UI [10]. Interestingly, the AFS healing process aligns with the timeline for UI recovery after enucleation, further substantiating the significance of this muscle unit.

In conclusion, our evolving understanding of urinary continence mechanisms, particularly in the context of prostate enucleation, necessitates a re-evaluation of traditional concepts. Revelation of the AFS as the critical factor in passive continence could significantly reshape future surgical practices and improve patient outcomes. This shift in focus to the AFS underscores the importance of continuous research and adaptation in medical practice to ensure that patient care remains at the forefront of surgical advances.

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