



**ORIGINAL RESEARCH PAPER**

**Radiology**

**AN UNUSUAL CASE OF EXTRAVASATION OF CONTRAST INTO THE CORPUS SPONGIOSUM, FOLLOWED BY INTRAVASATION OF THE CONTRAST INTO THE CORPUS CAVERNOSUM ON RUG.**

**KEY WORDS:** RUG, penis, contrast extravasation, contrast intravasation, corpus spongiosum, corpus cavernosum.

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**ABSTRACT**

Generally, a RUG / ASU is performed to visualize the abnormalities of anterior urethra. In traumatic situation a RUG/ ASU should be ideally performed first. As foley's insertion is required in MCU, it is not advised to do it blindly in setting of trauma. In this article we will discuss the detailed anatomy of the penis and urethra, with its blood supply, innervation and lymphatic drainage.

**INTRODUCTION**

**Anatomy of penis:**

The **penis**, is the male genital / copulatory organ located just above the scrotum, and it is attached to the pubic symphysis by two suspensory ligaments.

It takes part in two vital functions: sexual and urinary. It has a tri-cylindrical structure, formed by two vascular tissue bodies (**Corpora cavernosa**) (CC) and the **Corpus spongiosum** (CS).

The CCs have two parts: a **fixed posterior** and **anterior or free**.

The corpus cavernosum is covered by the tunica albuginea. The tunica albuginea is an elastic fibrous structure, which gives rigidity to the penis.

The Corpus Spongiosum begins from the perineum and is covered by bulbocavernosus muscle. Corpus spongiosum harbors urethra within it for its entire length. Distally the corpus spongiosum opens up into tip of the penis also known as glans, here through the meatus the urethra forms the urethral opening.

Layers of the penis: The superficial fascia of penis (Dartos fascia of penis), deep fascia of penis (Buck's fascia- which surrounds the corpus cavernosum and spongious) and tunica albuginea.

The buck's fascia is the most resistant of them.

**Penile arteries supply the penis**, branch of internal pudendal artery which is a branch of the hypogastric artery which further gives three branches:

1. **Dorsal artery,**
2. **Cavernous artery and**
3. **Bulbourethral artery,** which further divides into two branches **bulbar** and **urethral**.

The **corpus cavernosa** is supplied by the **cavernous arteries**.

**Venous drainage** is complex and is divided as:

**Superficial.**

**Deep consisting of ----** Deep dorsal vein, the emissary veins, the cavernous veins, the crural veins and the circumflex veins.

**Nerve supply: It is supplied by -**

- Autonomus nervous system,
- Sympathetic (T11-L2),
- Parasympathetic (S2- 4).
- Somatic and Motor nerves.

**Lymphatic drainage:**

**1. Posterior urethra:**

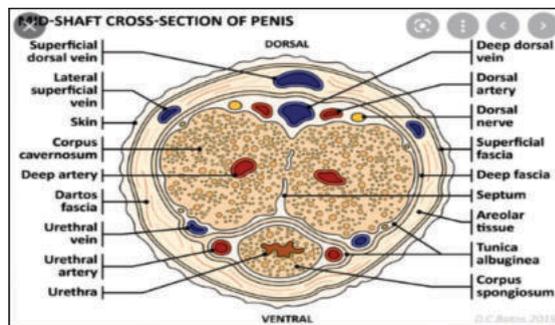
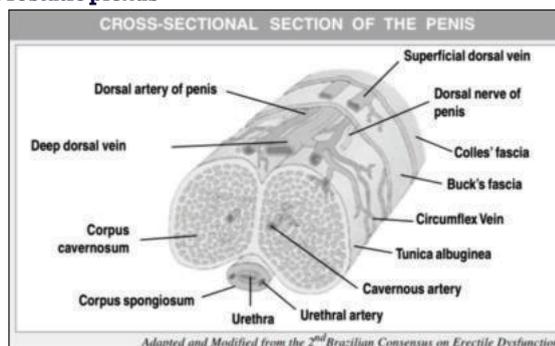
- Internal iliac lymph nodes,
- External iliac lymph nodes.

**2. Anterior urethra:**

- Deep inguinal lymph nodes,
- Superficial inguinal lymph nodes.

**Innervation:**

**Prostatic plexus**



**Radio-anatomy of urethra:**

**Male urethra-**

The male urethra is a fibromuscular tube that drains urine from the bladder. It has a longer, more complicated, course than the female urethra and is also more prone to pathology.

**Gross anatomy:**

The male urethra measures, on average, **18-20 cm** in length. It commences at the internal urethral orifice in the trigone of the bladder and opens in the navicular fossa of the glans penis at the external urethral meatus, which is the narrowest part of the urethra.

The male urethra can be divided into anterior and posterior portions. The anterior urethra is composed of the penile and

bulbar urethra to the level of the urogenital diaphragm.

**Anterior urethra-**

**penile (spongy, pendulous) urethra (~16 cm long):** encased by corpus spongiosum of the penis.

- the longest portion
- the fossa navicularis is a small normal dilatation of the distal penile urethrabulbar (bulbous) urethra: traverses the root of the penis
- it receives the ducts from the bulbourethral glands and the glands of Littre

The anterior urethra is lined by pseudostratified columnar epithelium. The very distal portion (at approximately the level of the fossa navicularis) is lined by squamous epithelium.

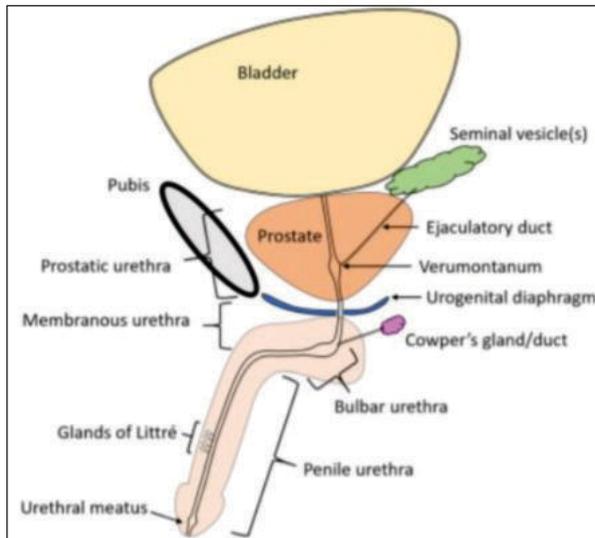
**Posterior urethra-**

**Membranous urethra (1 cm long):** passes through the urogenital diaphragm, surrounded by sphincter urethrae the **shortest** and **narrowest** portion

**Prostatic urethra (3 cm long):** surrounded by the prostate gland; on its posterior wall runs the urethral crest and the prominent smooth muscle verumontanum.

- the **verumontanum** receives the prostatic utricle in the midline and the ejaculatory ducts just distal to the prostatic utricle; on either side of it lie the prostatic sinuses, where numerous small prostatic ducts drain

The posterior urethra is lined by transitional columnar epithelium.



**CASE STUDY**

A 72-year-old male, came with chief complain of difficulty while passing urine. There was associated history of saddle trauma.



**Image 1:** Injected contrast is seen reaching up to the penile urethra with its opacification, a focal irregular stricture is noted at the junction of the bulbar and

**membranous urethra.**



**Image 2:** The contrast is further seen crossing the stricture into prostatic urethra.



**Image 3:** Further passage of contrast is noted as a thin streak into the prostatic urethra with flow in the urinary bladder. Extravasation of contrast is also noted in the corpus spongiosum through a mucosal rent (false lumen).



**Image 4 and image 5:** Some of the contrast has intravasated into the corpora cavernosa with some of it entering into the draining superficial and deep veins.

**Diagnosis:**

**Retrograde urethrogram reveals:**

A focal irregular stricture at the junction of the bulbar and membranous urethra, with urethro-venous intravasation into the corpus cavernosum and extravasation of contrast through a mucosal rent into the corpus spongiosum.

**CONCLUSION:**

Venous intravasation in retrograde urethrography is associated with pre-existing mucosal breaches in strictures

when contrast enters submucosal venous plexus and intravasation occurs along the venous pathway.

Intravasation occurs due to the degree of pressure applied during contrast administration -- the higher the pressure, more are the chances of intravasation occurring.

Intravasation of the iodinated contrast into the venous circulation may lead to an allergic reaction including anaphylaxis. So, in case of intravasation it is advised to stop the procedure.

Venous extravasation in RGU is associated with injury to the urethra, leading to contrast entering the penile soft tissue and further extension can also be seen into not only the pelvic extraperitoneal space but also into the perineum.

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