



A SYSTEMIC STUDY ON HYDROCELE: AN SURGICAL REVIEW

Dr. Shivam Kumar Shakya¹, Dr. V.S. Yadav², Dr. Deepika Singh³

1. Final Year PG Scholar, Department of Shalya Tantra, Major S.D. Singh P.G. Ayurvedic Medical College & Hospital, Bewar Road, Farrukhabad, Uttar Pradesh.
2. Guide, Department of Shalya Tantra, Major S.D. Singh P.G. Ayurvedic Medical College & Hospital, Bewar Road, Farrukhabad, Uttar Pradesh.
3. Co -Guide, Department of Shalya Tantra, Major S.D. Singh P.G. Ayurvedic Medical College & Hospital, Bewar Road, Farrukhabad, Uttar Pradesh.

Corresponding Author - Dr. Shivam Kumar Shakya, Final Year PG Scholar, Department of Shalya Tantra, Major S.D. Singh P.G. Ayurvedic Medical College & Hospital, Bewar Road, Farrukhabad, Uttar Pradesh

ABSTRACT

The abnormal accumulation of serous fluid in the pelvis and groin caused by numerous etiologies, such as illnesses or trauma, is known as a hydrocele. It has different clinical symptoms, especially pain and mental distress. Understanding the anatomy, embryology, and physiology of hydrocele creation is essential to comprehending the initiation and development of the condition. Due to the variety of hydrocele classifications and etiologies, a deliberate differential diagnosis is crucial to preventing impending life-threatening consequences and delivering the right care. Identification of the underlying cause depends on properly defining the hydrocele as primary, secondary communicating, secondary non-communicating, microbe-induced, inflammatory, iatrogenic, trauma-induced, tumor-induced, canal of Nuck, congenital, and enormous.

Key Words- Hydrocele, Scrotal pain, Scrotal swelling,

Introduction:

A fluid-filled sac that is generally present in the scrotum and less frequently in the external genitalia and pelvic areas is the hallmark of a hydrocele. It could be a symptom of certain serious underlying disorders. A patent processus vaginalis or an imbalance of secretion and absorption inside the tunica vaginalis may be the cause of the fluid accumulation. A hydrocele can be divided into a number of categories and can affect both sexes at any age. Although hydrocele often causes little pain, it can have negative effects on the body and mind. If the right diagnostic and treatment approaches are taken, more issues may be avoided. We thoroughly discuss the classifications, etiology, pathophysiology, subsequent complications, assessment, and therapy of hydrocele in light of its morphological, embryological, and physiological background.

Anatomy

At the base of the front abdominal wall lies the inguinal area, or groin. It represents the inguinal canal, a tubular conduit that runs from the pelvis to the groin. The deep inguinal ring and superficial inguinal ring are the two apertures of the inguinal canal. Although the canal's anatomy is identical in males and females, it serves different purposes depending on the gender. The spermatic cord may travel between the testicles and abdomen in males thanks to the canal. The canal in females acts as a conduit for the uterine round ligament as it travels from the uterus to the labium majus. The processus vaginalis, a structure that forms from the peritoneum during gestational week 12, is also embodied by the inguinal canal throughout embryonic development.

It allows the testes to fall into the scrotal sac in men by extending through the inguinal canal and into the scrotum. The processus vaginalis undergoes programmed cell death to destroy the pathway between the peritoneum and scrotum when testicular descent is complete. The bottom part of the process following closure. The tunica vaginalis testis develops from the vaginalis. Failure to do so leaves the processus vaginalis patent, which can cause issues such as communicating hydrocele and inguinal hernia. The canal of Nuck is a patent pouch of peritoneum that forms in females when the processus vaginalis is not closed. Additionally, communicative hydrocele and inguinal hernia problems are linked to the canal of Nuck [1].

The fluid that accumulates in the bilayered tunica vaginalis causes a hydrocele. Due to the patent processus vaginalis, which permits peritoneal fluid to pass through the processus vaginalis into the scrotum and surround the testicle, this fluid generally builds up in babies [2]. If the extra fluid can't drain, it builds up. We list the possible causes of fluid in the scrotum.

Etiology

The disturbance of the lymphatic system is usually the most frequent. The postoperative complication of hydrocele is brought on by surgeries, such as laparoscopic varicocelectomy, which can either fully or partially compromise testicular lymphatic drainage [50]. Another reason for hydrocele is an imbalance of outflow and input into the lymphatic tissue around the scrotum [9, 51]. Aquaporin channels may be the cause of hydrocele that is not communicative. [52] Hattori et al. examined how aquaporin channel expression relates to noncommunicating hydrocele. Tunica vaginalis from hydrocele patients was examined, and the results were compared to a control group of males without hydrocele. In the tunica vaginalis of individuals with hydrocele, aquaporin channel one was found to be overexpressed, according to the study's conclusion. The hydrocele fluid may appear as a result of lymphatic drainage that is less than the output due to increased fluid output from capillaries with overexpressed aquaporin channel 1.

After a kidney transplant, a hydrocele might also happen. This most likely results from a disrupted lymphatic system. [53] Penn et al. explains a study that involved several kidney transplants and difficulties with the testicles. The most frequent consequence, hydrocele, was brought on by a disturbance of the lymphatic pathways along the iliac stream. Despite consistent fluid flow, the lymphatic disruption adversely hampered lymphatic absorption, which resulted in the hydrocele.

Management:

There are two categories of surgical treatment, **invasive** and **noninvasive**.

Non-invasive Options-

examination and duplex ultrasound Prior to aspiration and the use of sclerosing drugs to treat hydrocele, Doppler must be conducted in both an upright and supine posture. Aspiration and sclerotherapy are two of the noninvasive therapeutic techniques that are employed increasingly regularly. The optimum way to apply these approaches is in conjunction with one another. When hydrocele is treated solely with aspiration, it frequently returns [110]. One research found an 80% success rate for aspiration and sclerotherapy with doxycycline. Other sclerosing medications besides doxycycline may be used in conjunction with sclerotherapy; these other medicines may be just as effective as hydrocelectomy.

Surgical Procedures

One of the major surgical therapies for hydrocele is hydrocelectomy. When the hydrocele is significant and chronic, this operation is strongly advised [124]. Compared to its nonsurgical equivalent, hydrocelectomy is more intrusive but occasionally has a better success rate. The hydrocelectomy's primary disadvantage is its postoperative consequences. Scrotal edema, hematomas, chronic discomfort, diminished fertility, ongoing swelling, Fournier's gangrene, and infection are examples of postoperative consequences [125–127]. A recommended substitute is a minimal access hydrocelectomy since it is less invasive and requires a smaller incision. Saber describes a novel minimum access hydrocelectomy that reduces traumatic insult to the patient without compromising safety and effectiveness. In compared to a conventional hydrocelectomy, the operation lasts just 12 to 18 minutes, and the recuperation period is also decreased [126].

Conclusion

There are several etiologies for hydroceles, including canal of Nuck, congenital, gigantic, microbe-induced, inflammatory, secondary communicating, secondary noncommunicating, iatrogenic, trauma-induced, tumor-induced, and inflammatory. Hydrocele has to be treated properly and closely watched regardless of whether it affects young children or elderly patients, especially when uncommon secondary consequences endanger the patient's life or quality of life. Transillumination should no longer be used in the diagnosis of hydrocele and should be replaced with radiological imaging in both supine and upright postures. Prior to removing any techniques, all therapeutic choices should be taken into account.

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