



Scrotal Swellings: Synopsis of Differential Diagnosis (Part III)

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Abstract

Scrotal swellings enshrine clinical conditions affecting dermis and /or sub-cutaneous tissue, and those of scrotal contents. A clear cut insight into their symptoms and signs are imperative to comprehend before arriving at their precise diagnosis. A concerted endeavor in this direction has been made to appraise the audience with their nomenclature origin, clinical variants, presentation and clear cut diagnostic criteria. Accordingly angioedema, lichen simplex chronicus, orchitis, epididymitis related epididymo-orchitis, varicocele, testicular torsion, and hydrocele formed the subject matter. The role of Ultrasonography, Ultrasonic colour doppler imaging and magnetic resonance imaging in evaluating scrotal swellings has succinctly been emphasized to enrich the core curriculum of the viewers.

Keywords: Angioedema; Lichen simplex; Chronicus; Orchitis; Epididimitis; Epididmo-orchitis; Vericocele; Hydrocele; Inguinal hernia

Introduction

Vivid recitation of anatomy and physiology is paramount to take stock of swelling(s) of any of the structures of the scrotum, the salient features of which formed walk the talk through illustrations^[1]. Swelling, turgescence or tumefaction is a transient abnormal enlargement of a body part and /or its anatomical constituents not caused by proliferation of cells^[2]. It is caused by accumulation of fluid in tissues. It can occur throughout the body (generalized), or a specific part or organ can be affected (localized). Scrotum being one of the pre-eminent parts. The scrotal swellings^[3-5] are menacing challenging proposition affecting any of its structures starting with affliction of the skin in the form of angioderma^[6], acquired angioderma(AAE)^[7] and hereditary angioderma (HAE)^[8] and lichen simplex chronicus (LSC)^[9]. Besides, inflammation of the testis, the orchitis^[10,11], epididymis, the epididimitis^[11-13], and /or epididymo-orchitis^[14,15], pampiniform plexus, the Vericocele^[16], testicular torsion^[17], and collection of fluid in the tunica vaginalis testis, the Hydrocele^[18]

and exit/ slipping of small bowel into the scrotum, the inguinal hernia are its other presentations. It is, therefore, worthwhile to take stock of these conditions by their salient clinical presentation, diagnosis criteria including investigation like Ultrasonography^[19], Ultrasonic colour Doppler imaging^[20] and magnetic resonance imaging (MRI)^[21,22] to form the perspective clinical diagnosis. Accordingly, their cardinal briefs are defined in the adjoining tables (table 1 to 4) for a glance evaluation.

Scrotal swellings of dermis and sub-cutaneous tissue

Angioedema (Figure. 1a), lichen simplex chronicus (Figure. 2a & b): Nomenclature, clinical variants, salient presentation and diagnostic criteria are outlined in Table 1.

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Figure 1a: Scrotal swellings: Acquired angioedema affecting the scrotum.



Figure 2a,b: Scrotal swellings: Depicting lichen simplex chronicus.

Table 1 : Scrotal Swellings: Angioedema and Lichen simplex chronicus (LSC).

Nomenclature	Clinical variants	Presentation	Diagnostic criteria
Angioedema ^[6] , angioedema, /Quincke's edema, / angioneurotic edem Rapid swelling, edema of the dermis, subcutaneous tissue, mucosa and sub mucosal tissues.	Acquired angioedema (AAE) ^[7] Recurrent transitory swelling affecting the face, lips, tongue, limbs, and genitals, medication by angiotensin-converting-enzyme inhibitor (ACE inhibitor) Hereditary angioedema(HAE) ^[8] Caused by a genetic mutation inherited in an autosomal dominant form, distinguished by the underlying genetic abnormality.	In addition to the clinical picture supplement of haemogram, serum, electrolytes, liver and kidney functions are mandatory	Clinical as well as laboratory test, inhibitor of complement enzyme, C1 esterase (C1INH) for HAE ^[23]
Lichen simplex chronicus (LSC) ^[9,24] Thickening of the skin, variable scaling arising secondary to repetitive scratching / rubbing.	Lichen amyloidosis ^[10,25,26] The re-crossed keratinocytes that forms keratinocytes-derived amyloid in the dermis.	Intense, intermittent pruritus, scrotal erythema and edema Erectile dysfunction(ED) ^[27]	Stable pruritic plaque(s), marked by thickening, pigmentation exaggerated skin markings, the lichenification complemented by histopathology.

Scrotal swellings of the contents of the scrotum Orchitis, Epididymitis and Epididymo-orchitis (Figure 3)
 The origin of nomenclature, clinical variants, presentation and diagnostic criteria are succinctly defined in the adjoining (table 2)

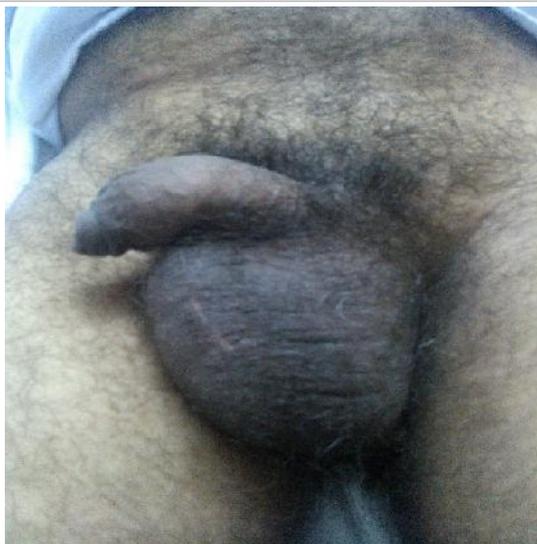


Figure 3: Scrotal swellings: Epididymo-orchitis.

Table 2: Scrotal Swellings: Orchitis, Epididymitis and Epididymo-orchitis.

Nomenclature	Clinical variants	Presentation	Diagnostic criteria
Orchitis [10,11,28] Inflammation of the testicles caused either by bacteria or virus, affecting one or both	<i>Vide infra</i>	painful urination/ ejaculation, Swollen and tender scrotum, Blood stained semen or abnormal discharge, Enlarged prostate, Enlarged groin lymph nodes and fever.	Inferno ^[29] Brown novel) colour Doppler ultrasound, a sign of orchitis.
Epididymitis ^[11,12,28,30] Discomfort or pain ^[31]	Acute, Chronic	Chills, low-grade fever, Pain/discomfort in the pelvic area, painful, red, warm and swollen scrotum, pain and tenderness in the testicles, enlarged groin lymph nodes, painful, frequent urination or bowel movements, painful intercourse and ejaculation.	Clinical Vide-infra see below
Epididymo-orchitis [14,15,32,33] Inflammation of the epididymis and/or testis	Acute gonococcal ^[34] / non-gonococcal urethritis (NGU) ^[35-40] / non specific urethritis (NSU), Chronic	Rapid swelling of epididymis and testis in a short course, a day or so. Painful, enlarged, tender and red scrotum.	Gram Stain of Urethral is charge with Intracellular Neisseria, gram-negative diplococci <i>Chlamydia trachomatis</i> ^[41] Testing Sensitivity in Midstream urine specimens

Varicocele and testicular torsion: The origin of nomenclature, clinical variants, presentation, and diagnostic criteria are shown for at a glance diagnosis in (table 3)

Table 3: Scrotal Swellings; Varicocele; Testicular torsion

Diagnosis	Clinical variants	Presentation	Diagnostic criteria
varicocele ^[16,28,42] enlargement of pampiniform plexus resulting from engorgement / swollen veins apparent as a testicular swelling, variable age group being 13 - 30 years. Classified into Grade 1: Smallest size Grade 2: Size between Grade 1 and 2 Grade 3: Largest size	Idiopathic /Pri-mary varicocele Secondary varicocele	Visible/palpable enlarged veins Dragging/ aching scrotal pain/ heaviness Atrophy of the testicle(s) Benign prostatic hyperplasia (BPH) Infertility ^[43,44]	Changing levels of testosterone ColorDoppler ultrasound (CDU) ^[46] presence of a venous plexus and the sum of the diameters of veins in the plexus change of flow on Valsalva maneuver / manoeuvre (Fig. 4, fig. 5)
Testicular torsion: ^[17,47-49] Twisting of the spermatic cord resulting in ischemia of the testicles,	Congenital	Sudden, severe, testicular pain and tenderness in the groin and lower abdomen	Clinical color ultrasound scan of the scrotum, eliciting absence of blood flow in the twisted testicle ^[50]

Hydrocele Testis and Inguinal Hernia: There nomenclature’s origin clinical variants, presentation, and diagnostic criteria are shown in table 4, Fig 4, 5 (Figure 6a & b)

Table 4: Scrotal Swellings: Hydrocele Testis and Inguinal Hernia.

Diagnosis	Clinical variants ^[53]	Presentation	Diagnostic criteria
Hydrocele Testis ^[51-53] Hydrocele testis a painless swelling of the scrotum due to circumscribed collection of fluid in the tunica vaginalis testis	Primary hydrocele	Soft, non-tender, large swelling, non palpable testis Trans-illumination positive	Ultrasound mandatory for testicular visualization
	Secondary hydrocele due to disease(s) of testis. Acute/chronic epididymo-orchitis, Torsion of testis Testicular tumor Hematocele Filarial hydrocele Post herniorrhaphy Hydrocele of an hernial sac	Fluctuating, non-reducible swelling No cough impulse It is more of a symptom than an actual pathological entity Palpation of testis impossible except for funicular and encysted hydrocele Trans-illumination elicitable	Diffusion-weighted MRI of the testis ^[54] Apparent diffusion coefficient (ADC) Reduced ADC values of testis, indicating reduced diffusion of the testis, with an increasing amount of fluid.(Figure 7a & b)
	Infantile hydrocele	Infertility(?) ^[55]	
	Congenital hydroceles		
	Encysted hydrocele of the cord		
Inguinal hernia	Groin hernia	Apparent, reducible scrotal swelling Pain/discomfort while coughing, exercise, or bowel movements.	Magnetic resonance imaging (MRI) ^[57] a diagnostic tool of high predictive value
An exit/slipping of a bowel from the abdomen through the wall of the cavity into the scrotum ^[51,56] . It may either be direct or indirect hernias, which may or may not extend down to the scrotum.	Herniation of small bowel through the external inguinal ring to scrotum.		
	Femoral hernia	Worsens in the day comfortable while lying. severe pain on strangulation	
	Herniation of part of the abdominal contents, passing through weak area, the femoral ring at the posterior wall of the femoral canal. These swellings do not extend to the scrotum but rather are found below and lateral to the superficial inguinal ring		

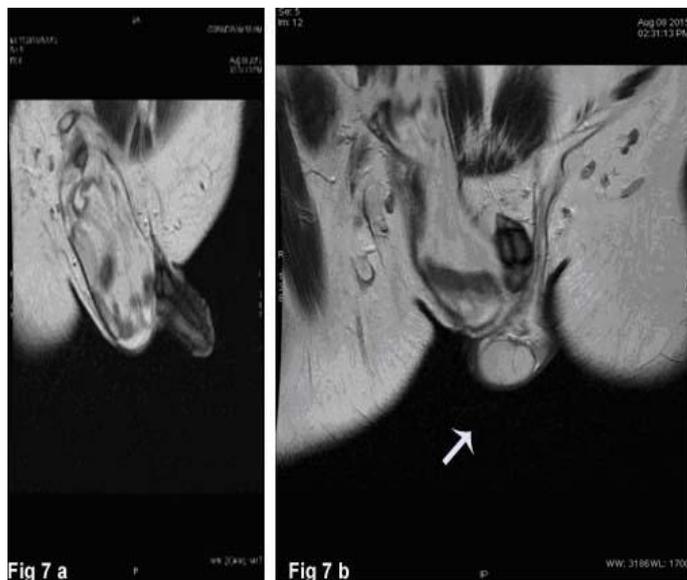


Figure 7a & b: Scrotal swellings: Axial T2 Weighted images showing mild fluid in left scrotal sac (white arrow- left testis, white arrowhead-right testis)

Synopsis of differential diagnosis

Scrotal swellings may either be of dermis, subcutaneous tissue or contents of scrotum, the utility of this diversification may prove beneficial, while preparing the instant day to day clinical dissertation. Besides, the afore mentioned conditions sarcoidosis^[58] presenting as hydrocele (*vide supra*) and juvenile

dermatomyositis(JDM)^[59] characterised by edema of the penis and scrotum should also be considered.

Multiple choice questions (MCQs)

1. Which of these aspects of the clinical history would alert you to a possible diagnosis of hereditary angioedema in a patient with angioedema?

- a. Early onset of angioedema before early adulthood
- b. Angioedema but no wheals
- c. Family history
- d. No history of laryngeal oedema
- e. Prodromal symptoms

- i. a, b and c
- ii. a, b, c and e
- iii. a, b, d and e
- iv. a and d
- v. a, b, c and d

Answer: ii

1. Which of the following is not a factor in the development of urticaria?

- a. Activation of sensory nerves
- b. Vasodilatation
- c. Extravasation
- d. Recruitment of pro-inflammatory cells

e. Separation of epithelial cells

Answer: e

2. For lichen simplex chronicus what is the single most important treatment?

- Topical corticosteroids
- Oral corticosteroids
- The patient must bathe regularly
- The patient must stop scratching

Answer: a

3. The epididymis is a _____ and it functions to _____.

- compartment inside a testis; secrete testosterone and form sperm
- stage of spermatogenesis; form two sperm cells and semen
- tightly coiled tube on the outside of the testis; store immature sperm as they mature
- compartment that contains seminiferous tubules; ejaculate sperm and semen out of the penis

Answer: c

4. Although epididymitis is uncommon in children, the most common cause of epididymitis is the

- H. influenzae*
- Coliforms
- Staph. Aureus*
- C. trachomatis*

Answer: d

5. Choose the correct statement: - Hydrocele of the canal of Nuck

- Is mostly observed in males.
- Is usually found affecting females.
- Is formed due to fluid collection in the femoral canal.
- Is seen in children as well as adults.
- Is a painful, translucent and reducible swelling.

Answer: b

6. Which of the following are not usually observed in epididymo-orchitis:

- The epididymal tail is often more swollen than the head.
- In the majority of case there is some oedema and swelling of the testis.
- In the majority of cases there is a large hydrocele containing debris.
- In some cases there is swelling of the spermatic cord.
- The mumps virus causes orchitis without epididymitis.

Answer: c & d

7. In torsion of the testicular appendix, which of the following is incorrect?

- The condition causes only mild pain.
- The testis is relatively hypo-vascular on Doppler Study.
- There is often swelling of the spermatic cord.
- The condition does not occur in adults.

Answer: a

8. Varicocele is more common in left testis because :

- Left testicular vein drains into IVC which has high pressure
- Left testicular vein drains into left renal vein and has poor valve mechanism
- Left testis is lower situated
- Compression of testicular vein by rectum

Answer: b

9. Which of the following statements about the causes of inguinal hernia is correct?

- Excessive hydroxyproline has been demonstrated in the aponeuroses of herniapatients.
- Obliteration of the processus vaginalis is a contributing factor for the development of an indirect inguinal hernia.
- Physical activity and athletics have been shown to have a protective effect toward the development of inguinal hernias.
- Elevated levels of circulating serum elastase activity have been demonstrated in patients with direct herniation who smoke.

Answer: d

References

- Malhotra, A., Sehgal, V.N., Lal, J.B. Scrotal Swellings: Scrotal anatomy and physiology (part I). (2016) Invest Dermatol Venereol Res 2(2): 1-3.
- Swelling. Dorland's Illustrated Medical Dictionary (31st ed.). (2007) Saunders.
- Eardly, L. Testis and scrotum in Bailey and Love's Short Practice of Surgery edited by Williams N. S., Bulstrode, C.J.K., O'Connell, P.R., Boca Raton Florida. (2013) CRC Press 26th edition: 1377-1391.
- Sehgal, V.N., Sehgal, N., Sehgal, R., et al. Acute scrotum: An Unusual presentation of Non-gonococcal/Non Specific Urethritis, Epididymitis and Orchitis Part II. (2015) Invest Dermatol Venereol Res 2(1): 1-3.
- Kavououssi, Parviz, K., Costabile, et al. "Disorders of scrotal contents: orchitis, epididymitis, testicular torsion, torsion of the appendages, and Fournier's gangrene". (2011) In Chapple, Christopher R.; Steers, William D. Practical urology: essential principles and practice, London. Springer-Verlag.
- Axelrod, S., Davis-Lorton, M. "Urticaria and angioedema". (2011) The Mount Sinai journal of medicine New York 78(5): 784-802.
- Fain, O., Gobert, D., Khau, C.A., et al. Acquired angioedema. (2015) Presse Med 44(1): 48-51.
- Muñoz Peralta, F., Buller Vigueira, E., Cabello Pulido, J. Hereditary angioedema type I: a case report. (2016) Medwave 16 (1): e6378.
- Pleimes, M., Wiedemeyer, K., Hartschuh, W. Lichen simplex chronicus of the anal region and its differential diagnoses: A case series. (2009) Hautarzt 60(11): 907-912.
- Gruenberg, H. Three unusual cases of chronic orchitis clinically resembling tumors of the testis. (1926) Frankfurt Z Pathol 33: 217-227.
- Walker, N.A., Challacombe, B. Managing epididymo-orchitis in general practice. (2013) Practitioner 257(1760): 21-25, 2-3.
- Weidner, W., Schiefer, H.G., Garbe, C. Acute nongonococcal epididymitis: etiological and therapeutic aspects. (1987) Drugs 1: 111-117.
- Mitttemeyer, B.T., Lennox, K.W., Borski, A.A. Epididymitis: a review of 610 cases. (1966) J Urol 95(3): 390-392.
- Taylor, S.N. Epididymitis. (2015) Clin Infect Dis 61(Suppl 8): S770-773.
- Walker, N.A., Challacombe, B. Managing epididymo-orchitis in general practice. (2013) Practitioner 257(1760): 21-25, 2-3.

16. "Varicocele". Oxford Dictionaries. Oxford University Press. Retrieved 2016-01-21.
17. Cubillos, J., Palmer, J.S., Friedman, S.C., et al. Familial testicular torsion. (2011) *J Urol* 185(6): 2469-2472.
18. Beard, J.H., Ohene-Yeboah, M., Devries, C.R., et al. Hernia and Hydrocele. Editors (2015) *The International Bank for Reconstruction and Development / The World Bank vol.1, Chapter 9*.
19. Rizvi, S.A., Ahmad, I., Siddiqui, M.A., et al. Role of color Doppler ultra-sonography in evaluation of scrotal swellings: pattern of disease in 120 patients with review of literature. (2011) *J Urol Winter* 8(1): 60-65.
20. Pilatz, A., Wagenlehner, F., Bschiepfer, T., et al. Acute epididymitis in ultrasound: results of a prospective study with baseline and follow-up investigations in 134 patients. (2013) *Eur J Radiol* 82(12): 762-768.
21. Parker, R.A., Menias, C.O., Quazi, R., et al. MR Imaging of the Penis and Scrotum. (2015) *Radiographics* 35(4):1033-1050.
22. Watanabe, Y. Scrotal Anatomy at MRI. (2012) *Scrotal Pathology Part of the series Medical Radiology* 55-66
23. Frazer-Abel, A., Giclas, P.C. Update on laboratory tests for the diagnosis and differentiation of hereditary angioedema and acquired angioedema. (2011) *Allergy Asthma Proc* 17-21.
24. Pleimes, M., Wiedemeyer, K., Hartschuh, W. [Lichen simplex chronicus of the anal region and its differential diagnoses: A case series.]. (2009) *Hautarzt* 60(11): 907-912.
25. Weyers, W. [Lichen amyloidosis-disease entity or the effect of scratching]. (1995) *Hautarzt* 46(3): 165-172.
26. Weyers, W., Weyers, I., Bonczkowitz, M., et al. Lichen amyloidosis: a consequence of scratching. (1997) *J Am Acad Dermatol* 37(6): 923-928.
27. Juan, C.K., Chen, H.J., Shen, J.L., et al. Lichen Simplex Chronicus Associated With Erectile Dysfunction: A Population-Based Retrospective Cohort Study. (2015) *PLoS One* 10(6): e0128869.
28. Dorland's illustrated Medical Dictionary. (1981) W.B. Saunders Company 26th edition.
29. Artul, S., Abu Rahmah, Y., Abu Shkara, H., et al. Inferno: colour Doppler ultrasound sign of orchitis. (2014) *BMJ Case Rep*.
30. Kim, S.D., Kim, S.W., Yoon, B.I., et al. The Relationship between Clinical Symptoms and Urine Culture in Adult Patients with Acute Epididymitis. (2013) *World J Men's Health* 31(1): 53-57.
31. Michel, V., Pilatz, A., Hedger, M.P., et al. Epididymitis: revelations at the convergence of clinical and basic sciences. (2015) *Asian J Androl* 17(5):756-763.
32. Johnson, T.B., Davies, D.V., Davis, F. *Grey's Anatomy* 35th edn. (1973).
33. Nicholson, A., Rait, G., Murray-Thomas, T., et al. Management of epididymo-orchitis in primary care: results from a large UK primary care database. (2010) *Br J Gen Pract* 60(579): e407-e422.
34. Anonymous. *Neisseria gonorrhoea and gonococcal infections*. (1978) *World Health Organ Tech Rep Ser* (616): 1-142.
35. Rane, V.S., Fairley, C.K., Weerakoon, A., et al. Characteristics of acute nongonococcal urethritis in men differ by sexual preference. (2014) *J Clin Microbiol* 52(8): 2971-2976.
36. Horner, P., Blee, K., O'Mahony, C., et al. UK National Guideline on the Management of Non-gonococcal Urethritis. (2014) *International Journal of STD & AIDS*: 1-12.
37. Frølund, M., Lidbrink, P., Wikström, A., et al. Urethritis-associated Pathogens in Urine from Men with Non-gonococcal Urethritis: A Case-control Study. (2015) *Acta Derm Venereol* 96(5):689-694.
38. Bradshaw, C.S., Tabrizi, S.N., Read, T.R., et al. Etiologies of non-gonococcal urethritis: bacteria, viruses, and the association with orogenital exposure. (2006) *J Infect Dis* 193(3): 336-345.
39. Workowski, K.A., Berman, S. *Sexually Transmitted Diseases Treatment Guidelines*. (2010) *MMWR* 59(12): 1-110.
40. Blaivas, M., Sierzenski, P., Lambert, M. Emergency evaluation of patients presenting with acute scrotum using bedside Ultrasonography. (2001) *Acad Emerg Med* 8(1): 90-93.
41. Mangin, D., Murdoch, D., Wells, J.E. Chlamydia trachomatis testing sensitivity in midstream compared with first-void urine specimens. (2012) *Ann Fam Med* 10(1): 50-53.
42. Li, H., Zhang, Y. Case of varicocele (2015) *Zhongguo Zhen Jiu* 35:1288. Chinese
43. Kantartzi, P.D., Goulis, D.C.H., Goulis, G.D., et al. Male infertility and varicocele: myths and reality. (2007) *Hippokratia* 11(3): 99-104.
44. Shridharani, A., Owen, R.C., Elkelany, O.O., et al. The significance of clinical practice guidelines on adult varicocele detection and management. (2016) *Asian J Androl* 18(2): 269-275.
45. Kantartzi, P.D. Update on the role of varicocele in male infertility. Master degree dissertation. Thessaloniki: 2006.
46. Chiou, R.K., Anderson, J.C., Wobig, R.K., et al. Color Doppler ultrasound criteria to diagnose varicoceles: correlation of a new scoring system with physical examination. (1997) *Urology* 50(6): 953-956.
47. Ringdahl, E., Teague, L. "Testicular torsion". (2006) *Am Fam Physician* 74(10): 1739-1743.
48. Nason, G.J., Tareen, F., McLoughlin, D., et al. Scrotal exploration for acute scrotal pain: A 10-year experience in two tertiary referral pediatric units. (2013) *Scand J Urol* 47(5): 418-422.
49. Sharp, V.J., Kieran, K., Arlen, A.M. Testicular torsion: diagnosis, evaluation, and management. (2013) *American family physician* 88(12): 835-840.
50. Bhardwaj, P. Role of Color Doppler in Scrotal Lesions. (2009) *Indian J Radiol Imaging* 19(3): 187-190.
51. Palmer, L.S. Hernias and hydroceles. (2013) *Pediatr Rev* 34(10): 457-464.
52. Clarke, S. Pediatric inguinal hernia and hydrocele: an evidence-based review in the era of minimal access surgery. (2010) *J Laparoendosc Adv Surg Tech A* 20(3): 305-309.
53. Griffiths, J. Varieties of Hydrocele of the Tunica Vaginalis Testis and some Anomalous States of the Processus Vaginalis. (1894) *J Anat Physiol* 28(3): 291-302.
54. Gulum, M., Cece, H., Yeni, E., et al. Diffusion-weighted MRI of the testis in hydrocele: a pilot study. (2012) *Urol Int* 89(2): 191-195.
55. Politoff, L., Hadziselimovic, F., Herzog, B., et al. Does hydrocele affect later fertility? (1990) *Fertil Steril* 53(4): 700-703.
56. Fitzgibbons, R.J. Jr., Forse, R.A. Clinical practice. Groin hernias in adults. (2015) *The N Engl J Med* 372(8): 756-763.
57. Van den Berg, J.C., De Valois, J.C., Go, P.M., et al. Detection of groin hernia with physical examination, ultrasound, and MRI compared with laparoscopic findings. (1999) *Invest Radiol* 34(12): 739-743.
58. Shahid, A., Khan, M.R.C.S., Jonathan, L., Richenberg, et al. FRCS Scrotal swelling in sarcoidosis. (2004) *J R Soc Med* 97(10): 487-488.
59. Sallum, A.M., Silva, M.F., Michelin, C.M., et al. Penile and scrotum swelling in juvenile dermatomyositis. (2011) *Acta Reumatol Port* 36(2): 176-179.