# Chapter one

# The Introduction

## 1.1 Introduction:

Testis is important parts of male reproductive system localized in the scrotum in which they are suspended by the spermatic cord, and it is surrounded by three membranes, the tunica vaginalis-outer (parietal and visceral layer), the tunica albuginea -middle membrane of fibrous tissues and the tunica vasculosa –inner layer of areolar tissues. Inside the testis they are Multiple thin septations (septula) converge posteriorly to form the mediastinum testis which is forms the support for the entering and exiting testicular vessels and ducts, these septula also form 250 to 400 wedge-shaped lobuli that contain the seminiferous tubules they join other seminiferous tubules to form 20 to 30 larger ducts, known as the tubuli recti(McKinley 2006).

Varicocele is a cluster or varicose veins that take place in the scrotal area this veins have absent or weakened valves over the time weaken the vessel wall and causes vein dilatation. Many Varicocele are a symptomatic but sometimes can cause uncomfortable feeling specially when sitting or standing upright. It is more common in the left side of the scrotal. The serious effect of Varicocele can lead to infertility by damaging the sperm. High resolution ultrasound combined with Doppler and color flow techniques is an excellent method for evaluation the scrotum. The modality can, define cystic and solid lesions, monitor infectious process, identify Varicocele, determine torsion, localize undecided

testis and differentiate testicular from extratesticular lesions(Krebs et al 1997).

## 1-2 Problems of the study:

Spread of Varicocele among students of College of Police Sciences and Law and there is no screening for these cases to know the main causes of this disease, so that ultrasound is easy and best and safe modalities to do this

## 1-3 The objectives of the study:

### 1-3-1 Generalobjectives :

To study the main causes of Varicocele among Military Students.

### 1-3-2 Specific objectives:

To fine out the relationship between Varicocele and long standing situation.

To knew the prevalence of the Varicocele in the Sudanese military students,

To discover military student with asymptomatic Varicocele ,

To fine out the relationship between leg varcosis&Varicocele

To find out the relationship between the Varicocele and the family history

## 1-4 Significant of the study:

To help student of police and law sciences college to not be infected with Varicocele and early detection of the disease.

## 1-5 The overview of the study:

These studies include 5 chapters:-

Chapter one is an introduction theoretical framework shows the definition and basic information about the Varicocele, and the chapter presents the objective of the study, statement of the problem and importance of the study.

Chapter twoshows the literature review and the previous studies.

Chapter threedeals with material and methods of experiments.

Chapter fourdeals with data presentation and description of figures and the results of Varicocele patients which obtained from ultrasound examination.

Chapter fivediscussion, conclusion and recommendations.

# Chapter two

## Literature Review and Previous Studies

### 2-1 Anatomy:

The male reproductive system is composed of tow testis, tow epididymis which lie in the scrotum, tow seminal vesicles, two ejaculatory ducts, the prostate gland and the penis.The scrotum lies below the pubic symphysis, in front of the thighs and it is composed of two sac compartment which divide by muscular septum (Dartos) into right and left, each one contains testis, epididymis, ducts deferens (vas deferens), ampulla and Spermatic cord(McKinley 2006).

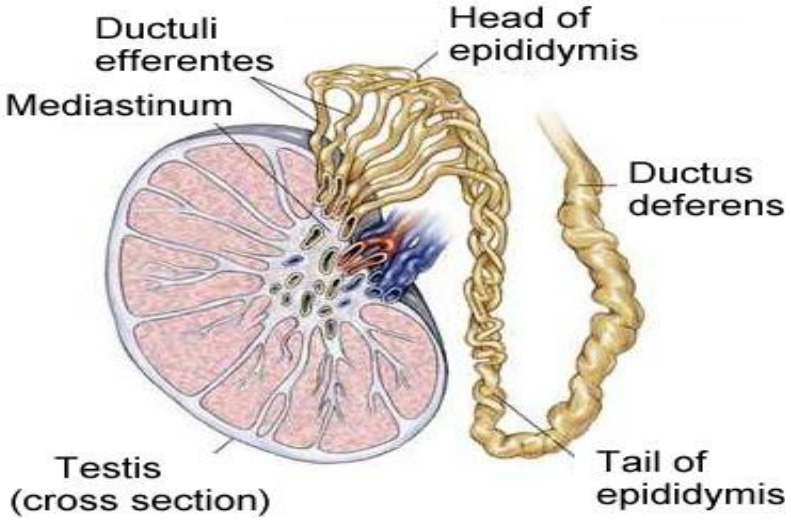



Figure: (1): shows the scrotum contains. (McKinley 2006).

### 2-1-1 Testis:

The adult testes are ovoid glands measuring 3 to 5 cm in length, 2 to 4 cm in width, and 3 cm in anteroposterior dimension. Testicular size and weight decrease with age. Testis localized in the scrotum in which they are suspended by the spermatic cord,

and it is surrounded by three membranes, the tunica vaginalis-outer (parietal and visceral layer), and the tunica albuginea -middle membrane of fibrous tissues and the tunica vasculosa – inner layer of areolar tissues. Inside the testis they are Multiple thin septations (septula) converge posteriorly to form the mediastinum testis which is forms the support for the entering and exiting testicular vessels and ducts, these septula also form 250 to 400 wedge-shaped lobuli that contain the seminiferous tubules they join other seminiferous tubules to form 20 to 30 larger ducts, known as the tubuli recti. The tubuli recti enter the mediastinum testis, forming a network of channels, called the rete testis. The rete terminate in 10 to 15 efferent ductules at the superior portion of the mediastinum, which carry the seminal fluid from the testis to the epididymis(Romach et al 2011).

**2-1-2 The epididymis:**

Is a curved structure measuring 6 to 7 cm in length and lying posterolateral to the testis. It is composed of a head, a body, and a tail. The head (globus major), is located adjacent to the superior pole of the testis and is the largest portion of the epididymis (10-12mm in diameter), the body ( corpus) lies adjacent to the posterolateral margin of the testis, The tail ( globus minor) is loosely attached to the lower pole of the testis by areolar tissue, measure 2-5mm in diameter(Romachet al 2011). The globus minor courses cephalad on the medial aspect of the epididymis to the spermatic cord(Romach et al 2011). The spermatic cord (ductus deference) is composed of arteries, veins, nerves, lymphatics, and

the seminal ductThere are small ovoid structure usually located on the superior pole of the testis or in the groove between the testis and the head of the epididymis called appendix testis. (Romach et al 2011).

Testicular blood flow is supplied primarily by the deferential, cremasteric (external spermatic), and testicular arteries. The deferential artery originates from the inferior vesical artery and courses to the tail of the epididymis, Thecremasteric artery arises from the inferior epigastric artery. It courses with the remainder of the structures of the spermatic cord through the inguinalring, continuing to the surface of the tunica vaginalis, where it anastomoses with capillaries of the testicular and deferential arteries. The testicular arteries arise from the anterior aspect of the aorta immediately below the origin of the renal arteries(Romachet al 2011).

The transmediastinal artery supplies the testis, entering through the mediastinum and coursing toward the periphery of the gland. These arteries may be unilateral or bilateral and single or multiple(Romach et al 2011).

## 2-2 **Physiology:**

The testes produce the male gametes and the male sexual hormones (androgens). The term spermatogenesis describes and includes all the processes involved in the production of gametes, whereas steroidogenesis refers to the enzymatic reactions leading to the production of male steroid hormones. Spermatogenesis and

steroidogenesis take place in two compartments morphologically and functionally distinguishable from each other. These are the tubular compartment, consisting of the seminiferous tubules (tubuliseminiferi) and the interstitial compartment (interstitium) between the seminiferous .

tubules Although anatomically separate, both compartments are closely connected with each other. For quantitatively and qualitatively normal production of sperm the integrity of both compartments is necessary. The function of the testis and thereby also the function of its compartments are governed by the hypothalamus and the pituitary gland (endocrine regulation). These endocrine effects are mediated and modulated at the testicular level by local control mechanisms (paracrine and autocrine factors)(Weinbauer et al 2010).

**2-2-1 Interstitial Compartment:**

It's consist of Leydig cells, immune cells, blood and lymph vessels, nerves, fibroblasts and loose connective tissue. Leydig cells are the source of testicular testosterone and of insulin-like factor 3(INSL3). For every 10–50 Leydig cells one macrophage is to be found to influence their proliferation, differentiation and steroid production, through the secretion of cytokines(Weinbauer et al 2010).

**2-2-2 Tubular Compartment:**

Spermatogenesis takes place in the tubular compartment. It contains the germ cells and two different types of somatic cells, the peritubular cells and the Sertoli cells.Sertoli cells synthesize

and secrete a large variety of factors: proteins, cytokines, growth factors, opioids, steroids, prostaglandins, modulators of cell division. Another important function of Sertoli cells is that they are responsible for final testicular volume and sperm production in the adult(Weinbauer et al 2010).

Through the production and secretion of tubular fluid Sertoli cells create and maintain the patency of the tubulus lumen. Sperm are transported in the tubular fluid its contains a higher concentration of potassium ions and a lower concentration of sodium ions. Other constituents are bicarbonate, magnesium and chloride ions, inositol, glucose, carnitine, glycerophosphorylcholine, amino acids and several proteins. Therefore, the germ cells are immersed in a fluid of unique compositionLH and FSH are glycoprotein hormones secreted by the pituitary gland that control development, maturation and function of the gonad(Weinbauer et al 2010).

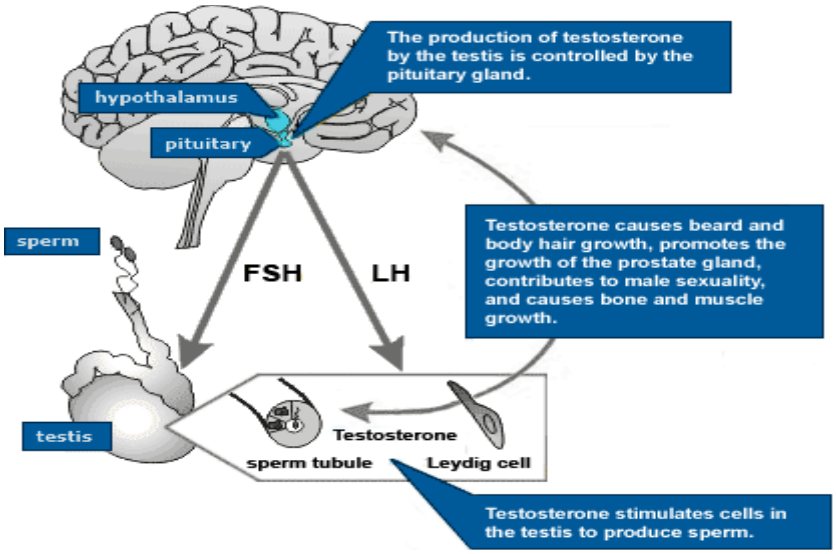



Figure: (2): shows the physiology of male reproductive system.(Weinbauer 2010).

## 2-3 Pathology:

### 2-3-1 Scrotal masses:

According to the site of tumor Scrotal masses divided into extratesticular and intratesticular masses, most extratesticular masses are benign, but the majority of intratesticular lesions are malignant(Romachet al 2011).

According to the origin most primary testicular tumors are of germ cell origin and are generally malignant (seminomas and nonseminomatous germ cell tumors(NSGCTs)) and also Gonadal stromal tumors, arising from Sertoli or Leydig cells and are generally benign(Romach et al 2011).

Gonadal stromal tumors in conjunction with germ cell tumors are called gonadoblastomas**.**The majority of gonadoblastomas

occur in male patients with Cryptorchidism, hypospadias, andfemale internal secondary sex organs

Nonseminomatous Germ Cell Tumors (NSGCTs) include Embryonal carcinomas, Teratomas, yolk sac tumors, Choriocarcinomas, and mixed germ cell tumors. These tumors occur more often in younger patients than do Seminomas(Romach et al 2011).

Sonographicaly pure seminomas have low-level echoes without calcification, and they appear hypoechoic compared with normally echogenic testicular parenchyma and have a more heterogeneous echotexture rarely, seminomas become necrotic and appear partly Cystic on sonography (Weinbauer et al 2010). NSGCTs are more heterogeneous than seminoma and may have both solid and cystic components. Coarse calcifications are common. It is not possible to distinguish the various subtypes of NSGCTs on sonography(Romach et al 2011).

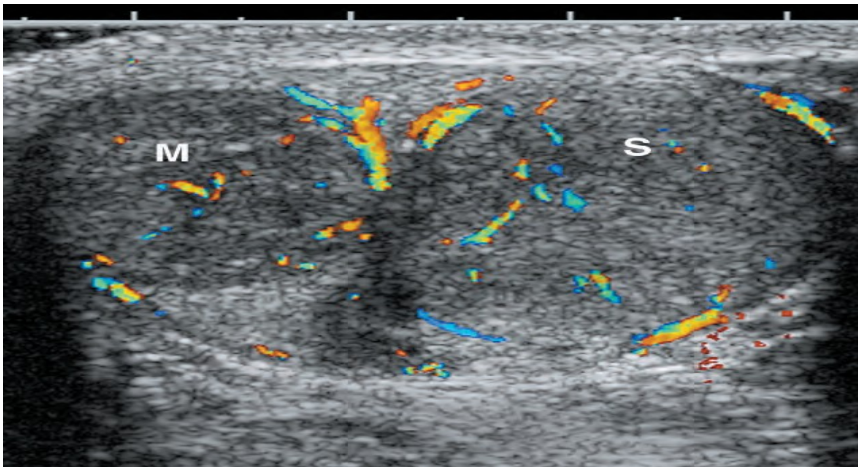



Figure (3) shows Mixed tumor.

(Transverse scan of coexistent mixed germ cell tumor *(M)* and seminoma *(S)).*

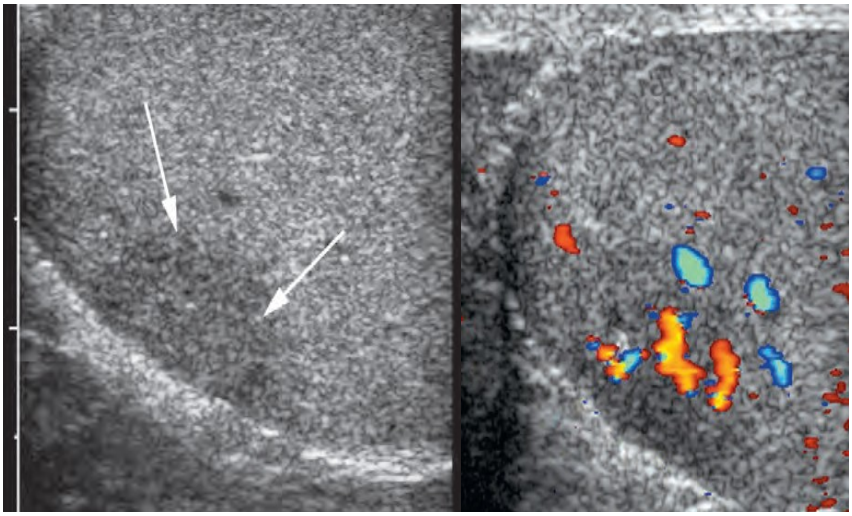


Figure (4) shows seminoma

(Longitudinal scans. **A** and **B,** Subtle hypoechoic seminoma *(arrows)* with increased flow)

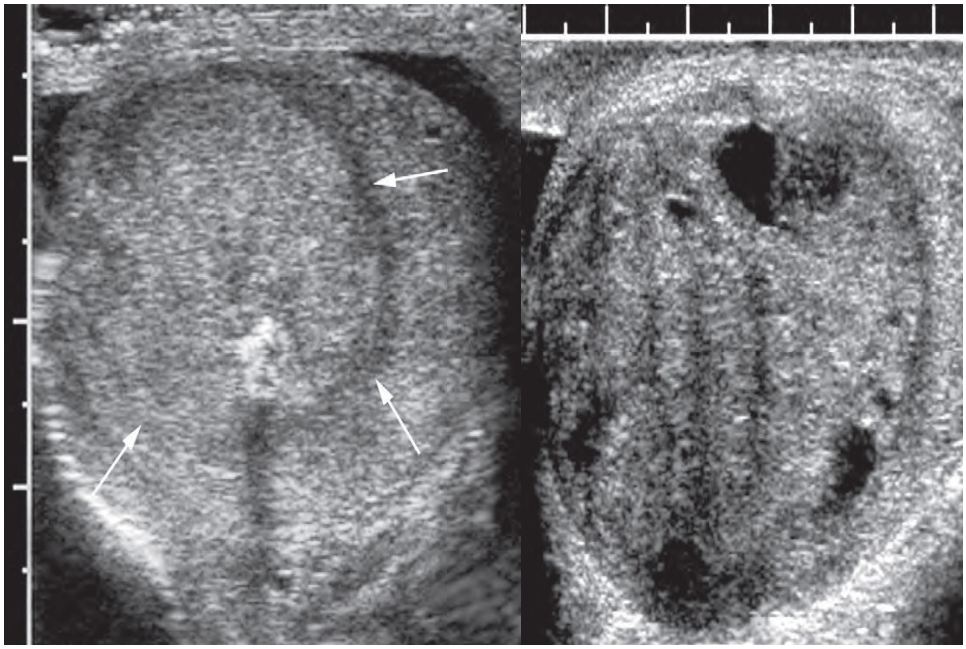


Figure (5) shows Nonseminomatous germ cell tumors:
(A, Transverse scan shows tumor *(arrows)* with coarse calcification B, Mixed germ cell tumor. Longitudinal scan shows a large tumor with cysticchange occupying most of the testis.)

### 2-3-2 Extratesticular Pathologic Lesions:

**2-3-2- 1 Hydrocele:** is an abnormal accumulation of serous fluid between the layers of the tunica vaginalis Rarely, hydrocele may be loculated around the spermatic cord above the testis and epididymis. Hydroceles may be congenital or acquired and it is considered the most common cause of scrotal swelling(Romachet al 2011). Sonographically anechoic fluid collection surroundings the testis except posteriorly where the tunica vaginalis is

absent(Weinbauer et al 2010).

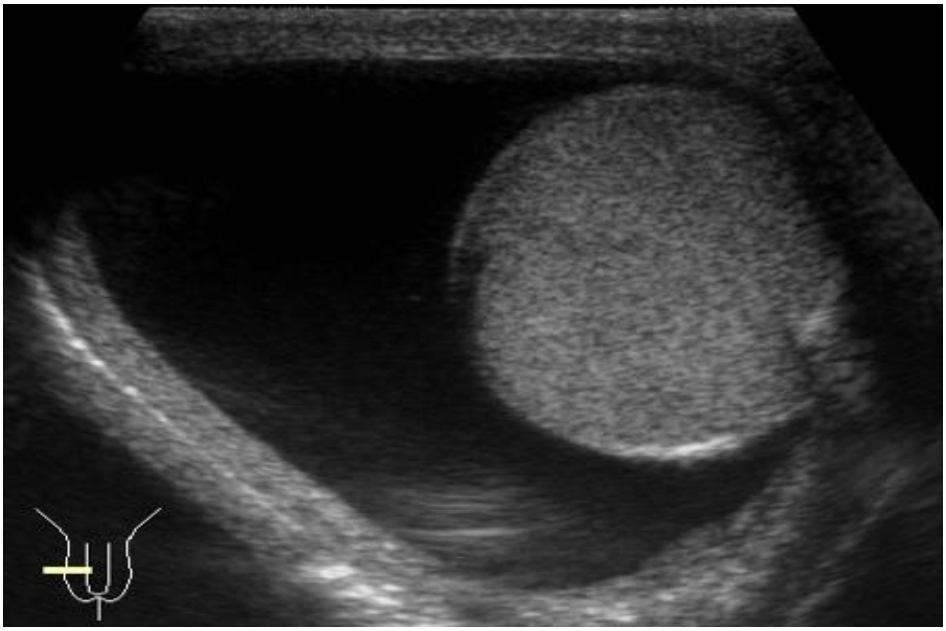


Figure (6) Hydrocele with peritesticular fluid in the tunica vaginalis.

2-3-2-2**Hematoceles:** is an accumulation of blood in the cavity of the tunica vaginalis result from trauma, surgery, neoplasms, or torsion.

Pyoceles is the presence of pus in the cavity of the tunica vaginalis result from

rupture of an abscess.

Sonographically both hematoceles and pyoceles contain internal echoes and are associated with internal septations and loculations(Romach et al 2011).

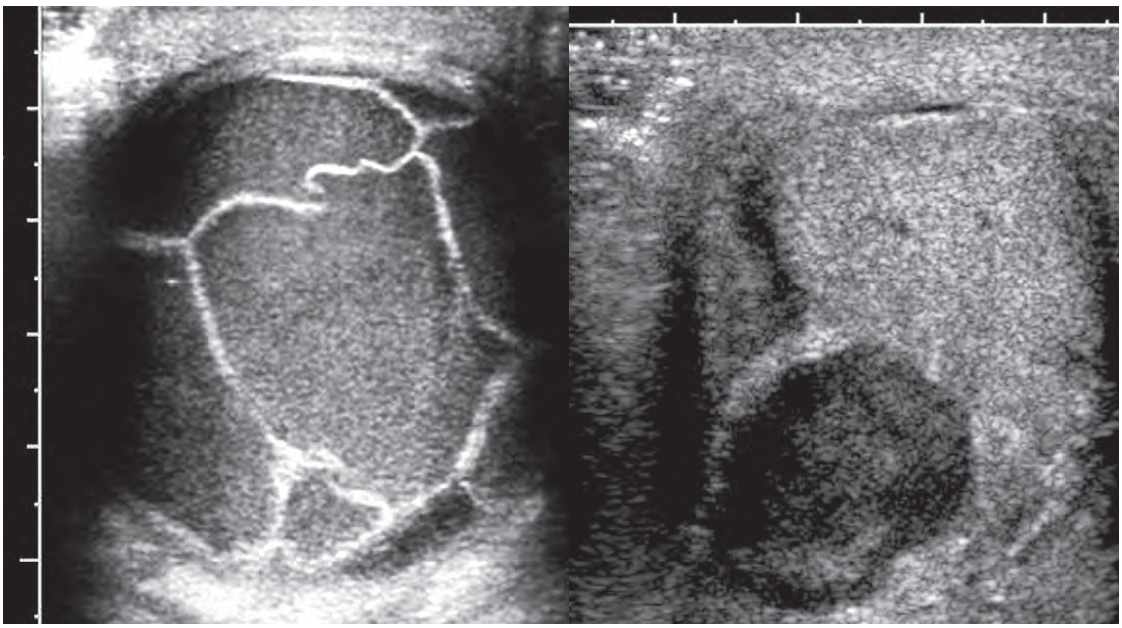


Figure (7) shows  Hematocele and Pyocele

(A, Hematocele. Transverse scan shows fluid with internal echoes and linear membranes. B, Pyocele. Transverse scan shows fluid collection with internal echoes.)

**2-3-3 Spermatoceles and epididymal cysts:**

Spermatocele is a cyst containing spermatozoa and debris and is almost always located in the head of epididymis

Sonographicallyspermatocele are located at the superior pole of the testis, are oval or round, solitary, 2-3 cm in diameter with echogenic, often layering fluid and septations are Common(Romach et al 2011).

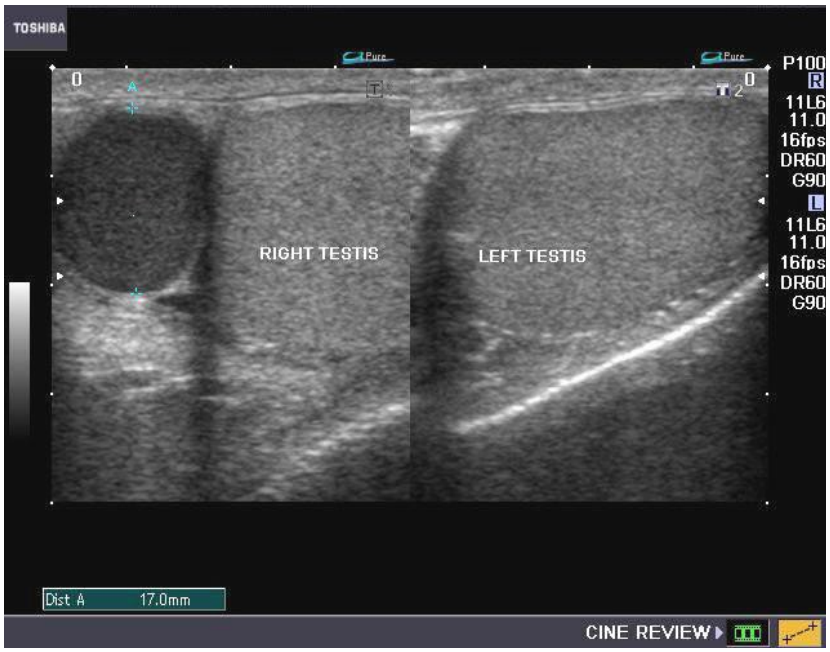
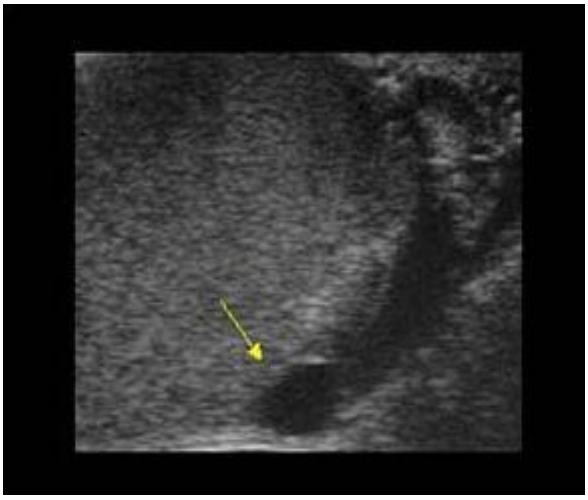



Figure (8) shows Spermatocele involving the head of right epididymis.

Epididymal cyst contains clear serous fluid and arises anywhere throughout the length of the epididymis

Sonographicallyepididymal cysts may be located anywhere in the epididymis. They have all the features of a simple cyst. They are often multiple and usually < 1cm diameter(Romach et al 2011).



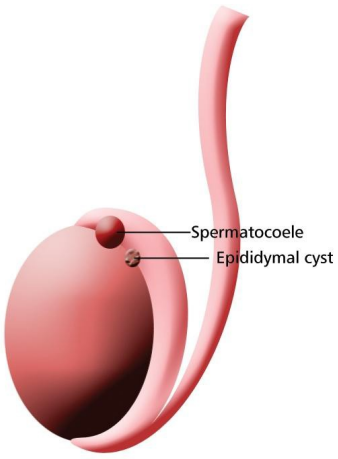


Figure (9) Epididymal cyst (shows Small epididymal cyst in the body of the epididymis)

**2-3-4 Benign cysts of the tunica albuginea:**

These cysts are usually firm, palpable testicular masses ranging size from 2 to 5mm. Located in the testis adjacent to the tunica albuginea(Romach et al 2011).

They may be solitary or multiple, unilocular or multilocular and anechoic or hypoechoic(Romachet al 2011).

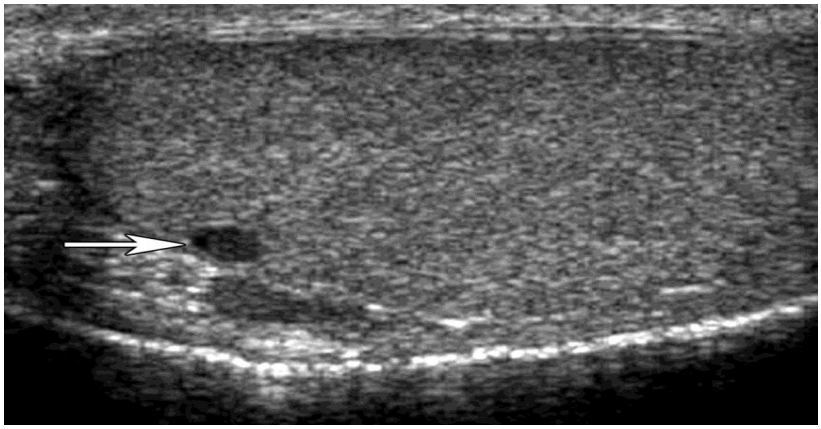


Figure (10) shows Tunica albuginea cyst adjacent to tunica albuginea.(Romach et al 2011)

**2-3-5 benignintratesticular cysts**:

These are simple cyst filled with clear serous fluid that varies in size from few mm to 1-2cm, Located within the testicular parenchyma and may be single or multiple. They become increasingly more common in older men(Romachet al 2011).

**2-3-6Sperm granulomas:**

They are extratesticular, inflammatory lesions, usually located adjacent to the testis or seminal vesicle.

Sonographically they appear as well circumscribed, hypoechoic, solid, heterogenous lesions located within the epididymis or ductus deferens(Romach et al 2011).

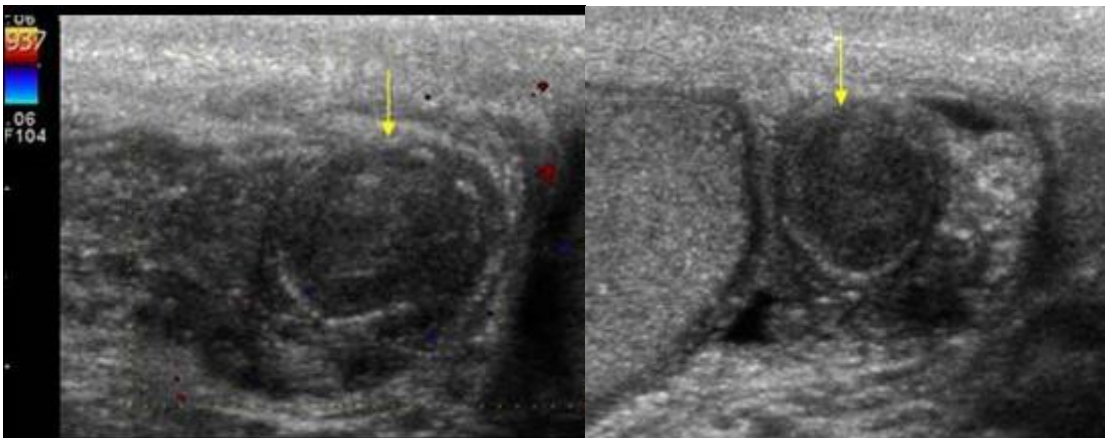


Figure (11) shows Sperm granuloma with a hypoechoic non vascularized round mass in the epididymal tail.(Romach et al 2011)

**2-3-7Scrotal hernia:**

They are usually diagnosed on the basis of clinical history and physical examination.Sonography is usefull in the evaluation of atypical cases such as inguinal hernias presenting as scrotal masses.The hernia may contain small bowel, colon, and/or omentum. Sonographically, a heterogenous mass is demonstrated extending from the inguinal canal to the scrotum. The mass moves and changes size with the Valsalva maneuver and hydrocele is often present(Romach et al 2011).

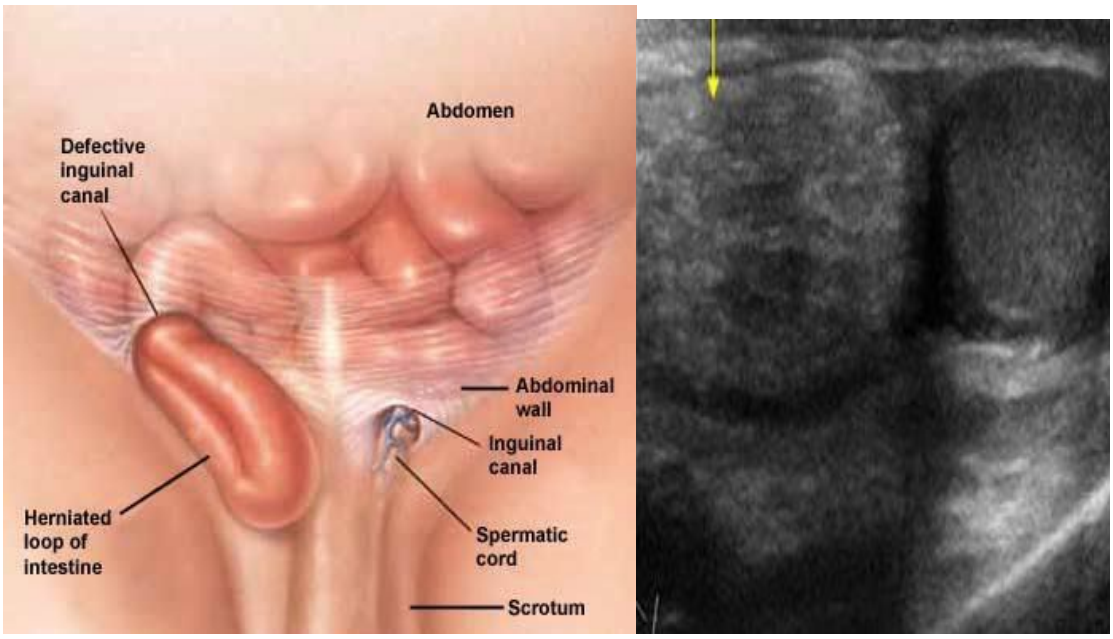



Figure (12) shows scrotal hernia

(Heterogenous mass extending from the inguinal canal to the scrotum)(Romach et al 2011)

**2-3-8Cryptorchidism (undescended testicles):**

Failure of the testis to migrate from the abdominal cavity through the inguinal canal and into the scrotum is significant. Undescended testicle search should begin at the scrotum and proceed up into the inguinal canal and finally into the pelvis.

Approximately 4% of neonates have undescended testes.

Infertility and a 40-50 fold increase in risk of cancer are complications of uncorrected Cryptorchidism(Romach et al 2011).

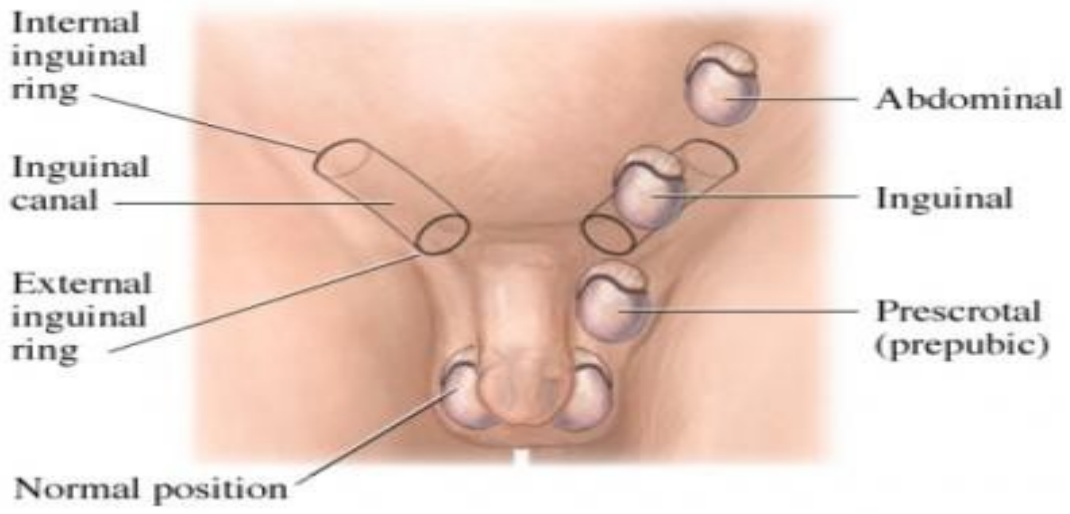



Figure (13) shows undescending testis(Romach et al 2011)

Sonographically the undescended testis is demonstrated as an oval solid mass with echogenicity that differ according to age.

In infants less than 1 year, the undescended testicle is approximately 1cm in size and isoechoic to descended testicles.

In older children and adults the undescended testicles is ovoid, hypoechoic and smaller (atrophic) when compared to normal testis(Romachet al 2011).

**2-3-9Torsion:**

Torsion of the testes most common occurs in the neonate or adolescent. Torsion leads to hemorrhagic infarction and necrosis of the testicle

Ultrasound appearances depend upon the degree of torsion and its duration

Torsion is divide to acute stage and late acute stage and each one got different sonographic criteria than the other. In acute stage (initial 6 hours), testis is normal and sometimes enlarged and

hypoechoic compared to the opposite side due to venous congestion. In the late acute stage (days 1-4) there is congestion with hypoechogencity, enlargement and necrosis causing anechoic areas.Colour(power) Doppler indicates complete absence of flow in complete torsion (Romachet al 2011).

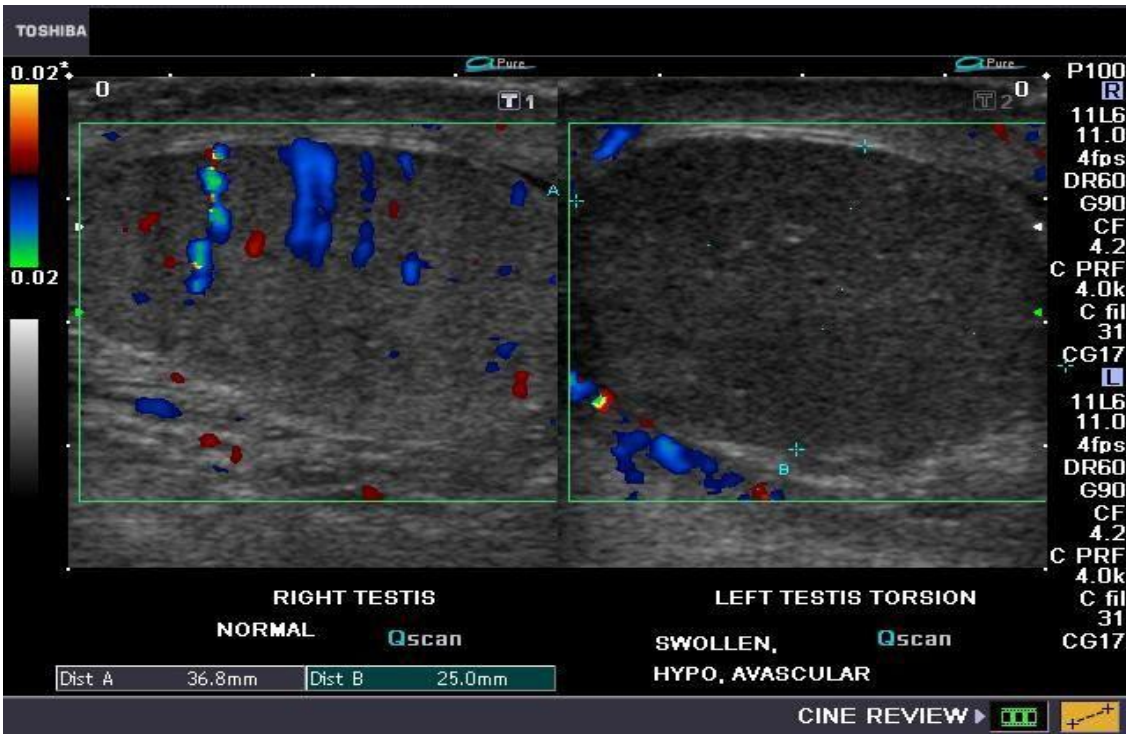



Figure (14) shows Left testicular torsion with absent of vascularization.

## 2-3-10Infection:

Acute testicular pain is most commonly caused by infection (epididymitis, orchitis and epididymoorchitis).

Sonographically, enlarged, hypoechoic (epididymis/testicles) with hydrocele with increase vascularity in color and pulsed Doppler(Romach et al 2011).

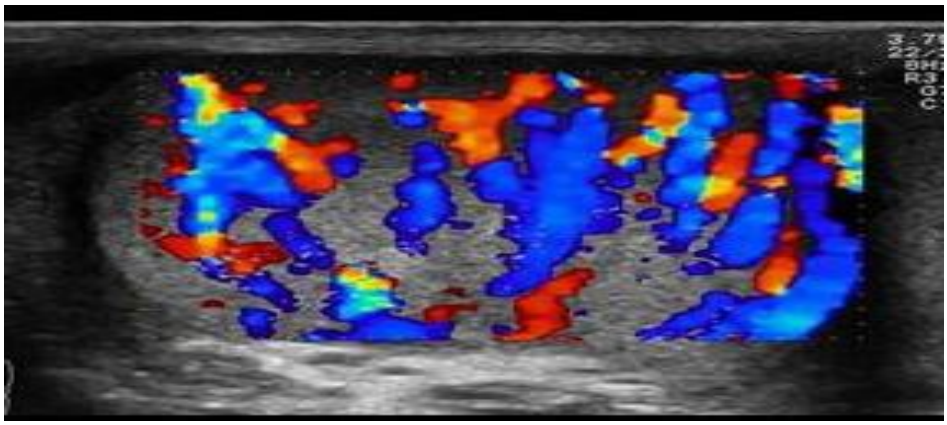


Figure (15) shows Orchitis with highly vascularized testis.

**2-3-11Varicoceles:**

is a collection of abnormally dilated, tortuous, and elongated veins of the pampiniform plexus located posterior to the testis, accompanying the epididymis and vas deferens within the spermatic cord.

The veins of the pampiniform plexus normally range from 0.5 to 1.5 mm in diameter, with a main draining vein up to 2 mm in diameter(Romach et al 2011).

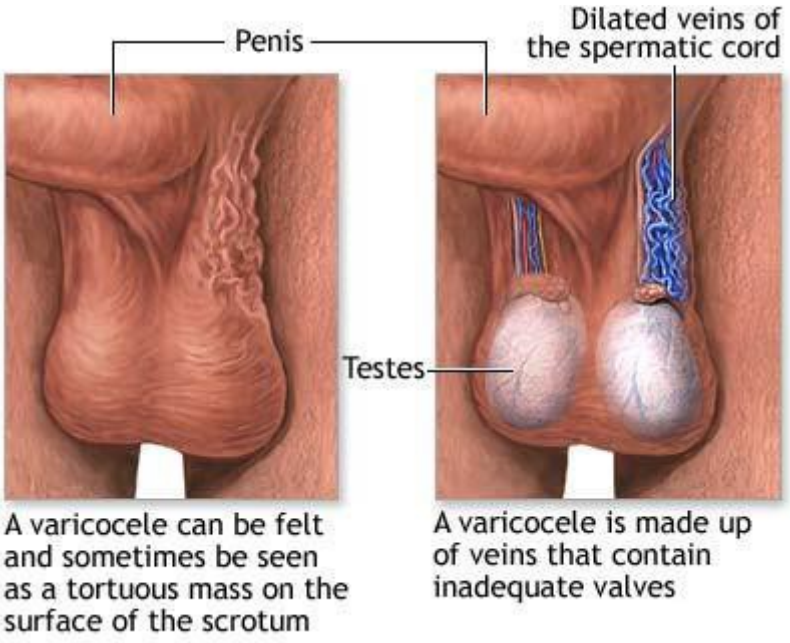



Figure (16) shows characterization of varicocele

There are two types of varicoceles: primary (idiopathic) and secondary.

The idiopathic varicocele is caused by incompetent valves in the internal spermatic vein, which permit retrograde passage of blood through the spermatic cord into the pampiniform plexus(Romach et al 2011).

Secondary varicoceles result from increased pressure on the spermatic vein or its tributaries by marked hydronephrosis, an enlarged liver, abdominal neoplasms, or venous compression by a retroperitoneal mass(Romachet al 2011).

Secondary varicocele may also occur in the nutcracker syndrome (nutcracker phenomenon), in which thesuperior mesenteric artery compresses the left renal vein.A search for neoplastic obstruction of gonadal venous return must be undertaken in cases of a rightsided, nondecompressible, or newly discovered varicocele in

a patient older than 40 years because these cases are rarely idiopathic. The appearance of secondary varicoceles is not affected by patient position(Romach 2011).

In infertile men, sonography aids in the diagnosis of clinically palpable and subclinical varicoceles. Sonography is also of value in assessing testicular size before and after treatment, because varicocele may be associated with a decreased testicular volume.There is poor correlation between the size of the varicocele and the degree of testicular tissue damage leading to infertility(Romach et al 2011).

Sonographically, the varicocele consists of multiple, serpentine, anechoic structures more than 2 mm in diameter, creating a tortuous, multicystic collection located adjacent or proximal to the upper pole of the testis and head of the epididymis(Romach et al 2011).

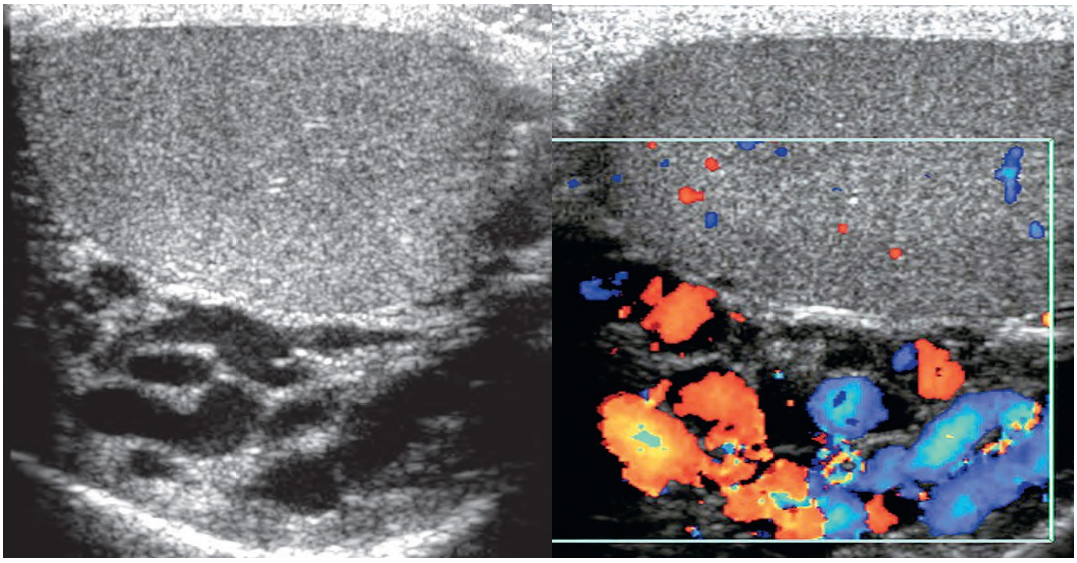


Figure (17) shows sperntine

(A, Longitudinal, and B, color Doppler, images show serpentine, hypo echoic, dilated veins posterior the testis.The blood flow in a varicocele is slow and

may be detected only with low-flow Doppler settings or the Valsalva maneuver)(Palmer 2003).

### 2-4-2 Imaging used in diagnosing

#### 2-4-2-1 Ultrasound physics

Ultrasound is one type of sound have high-frequency sound waves over 20KHz, these waves inaudible to humans, can be transmitted in beams and are used to scan the tissues of the body. these wave are generated by a piezoelectric transducer which is capable of changing electrical signals into mechanical (ultrasound) waves and it can also receive the reflected ultrasound and change it back into electrical signals. Transducer has many kinds but we use linear transducer to scan scrotum.The Doppler Effect occur if the reflector is moving towards the transmitter, the reflected frequency will be higher than the transmitted frequency, and vice versa. The deference between the transmitted and received frequencies is proportional to the speed with which the reflector is moving away from or approaching the transmitter. The Doppler can be use to demonstrate blood flow in the peripheral vessels (ituse to detect varicocele) (Palmer 2003).

#### 2-4-2-1 Ultrasound technique for testis:

It is helpful if the patient can localize a palpable nodule within the scrotum, which the sonologest can then palpate during the examination. The patient is examined in the supine position. The scrotum is elevated with a towel draped over the thighs, and the penis is placed on the patient’s abdomen and covered with a

towel. Alternatively, the scrotal sac may be supported by the examiner’s hand. A high-frequency (7.5-15 MHz) linear array transducer is typically used because it provides increased resolution of the scrotal contents. If greater penetration is needed because of scrotal swelling, a 6-MHz or lower frequency transducer may be used. (Romach et al 2011).

A direct-contact scan is most often performed using acoustic coupling gel.

Images of both testes are obtained in transverse and sagittal planes. If possible, a transverse scan showing both testes for comparison is obtained using a dual-imaging technique, a larger-footprint transducer, or extended– field of view imaging. Additional views may be obtained in the coronal or oblique planes, with the patient upright or performing the Valsalva maneuver when necessary.Color flow and power mode Doppler sonography are also performed to evaluate testicular blood flow in normal and pathologic states (Romach et al 2011).

## 2-5 Previous Studies:

### 2-5-1 varicocele and sperm affect

**Kantartzi** et al (2004)Design: Meta-analysis of studies identified via a search of PubMed, Medline, and the Cochrane Library covering the last 40 years.Setting: Not applicable.

Conclusion(s): The presence of varicocele in youth appears to negatively affect sperm density,motility, and morphology. Treatment appears to result in moderate improvement of spermdensity and mild improvement in sperm motility. (FertilSteril_ 2014;102:381–7. _2014 byAmerican Society for Reproductive Medicine.)

Key Words: Youth, varicocele, varicocele treatment, semen analysis

*http://fertstertforum.com/norkj-youth-varicocele-treatment-semen-outcomes*

### 2-5-2 Male infertility and varicocele: myths and reality. Conclusion

Varicocele is one of most debatable issues in the field of male infertility mainly with regard to surgical intervention. Many scientistsbelieves that the surgical repair of varicocele should include a very narrow group of infertile men. Nevertheless, there are no widely accepted criteria regarding the selection of this group of men. With development of ICSI techniqueduring the last few years, research should focus mainly on the effectiveness of surgical repair of varicocele taking under consideration the

pregnancy rates of the methods, their cost- effectiveness as well as couples preference.

Article information :

Hippokratia,2007jul-sep; 11(3): 99-104.

### 2-5-3 Report on varicocele and infertility: a committee opinion

Practice committee of the American Society for Reproductive Medicine and the Society for Male Reproduction and Urology, Birmingham, Alabama.

**Conclusions**

- Treatment of a clinically palpable varicocele may be offered to the male partner of an infertile couple when there is evidence of abnormal semen parameter and minimal/on identified female factor, including consideration of age and ovarian reserve.
- In vitro fertilization without ICSI may be consider the primary treatment option when such treatment is required to treat a female factor, regardless of the presents of varicocele and abnormal semen parameters.
- The treating physician’s experience and expertise, including evolution of both partners, together with options available, should determine the approach to varicocele treatment.

# Chapter Three

# Material and Methods

## 3-1 Material

### 3-1-1 Patient

Random sample of thirty two student of College of Police Science and Law RibatNational University their ages from (19-24) years.The target audience in this research is the students of faculty and police Law sciences and the ages of study samples are from 19 to 24 years old. The data of this study collected from 32 student randomly.This study carried out in Ribat Universal Hospital, Khartoum – Sudan. During the period from January 2016 to May 2016.

### 3-1-2 Machine

We use color ultrasound machine (Siemens). High frequency transducer ranged (5-10MHz).


Figure (18) shows color Ultrasound machine (Siemens,Sonoline G60S), Germany 2004.

**3-1-3Design of study:**

This descriptive cross – section study where the data collected from the students refer to the hospital.

**3-2 Methods:**

3-2-1 **Scanning technique:**

Patientposition**:** The patient is supine with slightly separated legs, the head of the patient is at level above the level of the legs.

Ultrasound gel is used, also gloves is used to protect the operator from infection.

The patient is asked to hold his penis and tracked it against his abdomen .

Coughing and Valsalva maneuver are applied.

Color Doppler andSpectrum are applied to differentiate blood vessels from other structures and arteries from veins.

Technique : there are Two main views are applied :

Transverse and longitudinal orientation probe is used, with additional projection if needed (oblique).

- Scrotal vessels are examined posterior to the testis.
- Pampinformvenous plexus seen inferior to the base of the penis.

At the end of the exam we clean the probe to protect the latter patient from infection.

**3-2-2 Variable of study**

The data this study collected using the following variable age, family history, and scrotal pain and leg varicosities.

**3-2-3 Method of data analysis:**

The of this study analyzed using SPSS under windows, the frequency distribution of the quantitives variables presented in table and graph.

**3-2-5 Image interpretation:**

Twoqualified sonologists performed the Reports of the ultrasound images.

# Chapter Four

## The Result

This study consists of 32 studentsof varicocele done in the medical radiography department at Al Ribat University Hospital department of the students of college of police and law.

More than 2 mm diameter in testicular vein diagnosed as varicocele.there is 3 grades (grade 1 from to 2-3 mm, grade 2 from 3-4 mm and grade 3 more than 4 mm).Most cases of varicocele a symptomatic and this study shows that.

**Table (4-1) shows Age distribution among the study population:**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | (16-20) | 16 | 50.0 | 50.0 | 50.0 |
| | (21-24) | 16 | 50.0 | 50.0 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

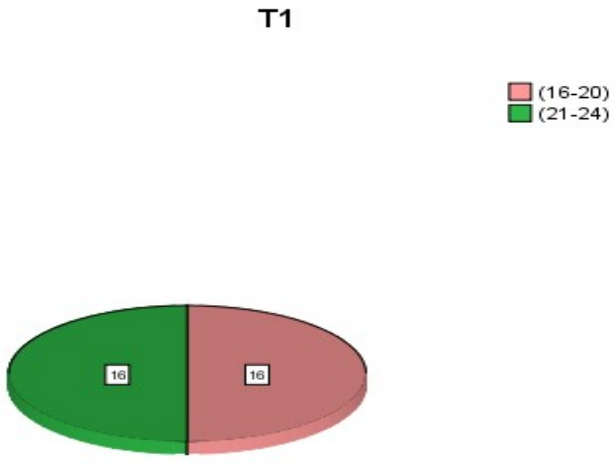



*Figure (4-1) shows age distribution*

Table (4-2) shows ultrasound finding of Rt testicle varicocele

Frequencies

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Posiyive | 7 | 21.9 | 21.9 | 21.9 |
| | Negative | 25 | 78.1 | 78.1 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

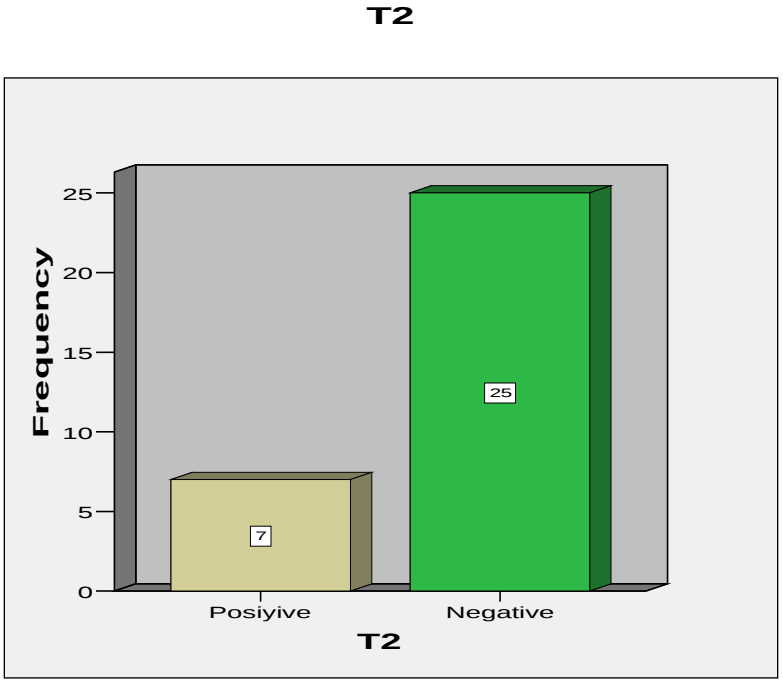



*Figure (4-2) show ultrasoundfinding of Rt testicle varicocele*

*Table (4-3) shows ultrasound finding of Lt testicle varicocele*

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Positive | 9 | 28.1 | 28.1 | 28.1 |
| | Nagative | 23 | 71.9 | 71.9 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

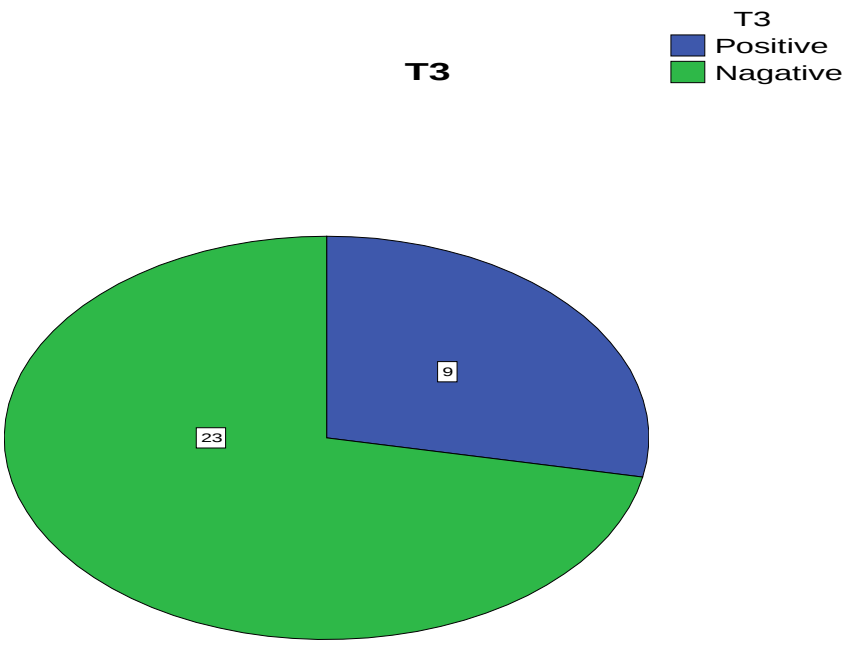


*Figure (4-3) show ultrasound finding of Lt. testicle varicocele*

***Table (4-4) shows Positive family history:***

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Positivie | 1 | 3.1 | 3.1 | 3.1 |
| | Negative | 31 | 96.9 | 96.9 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

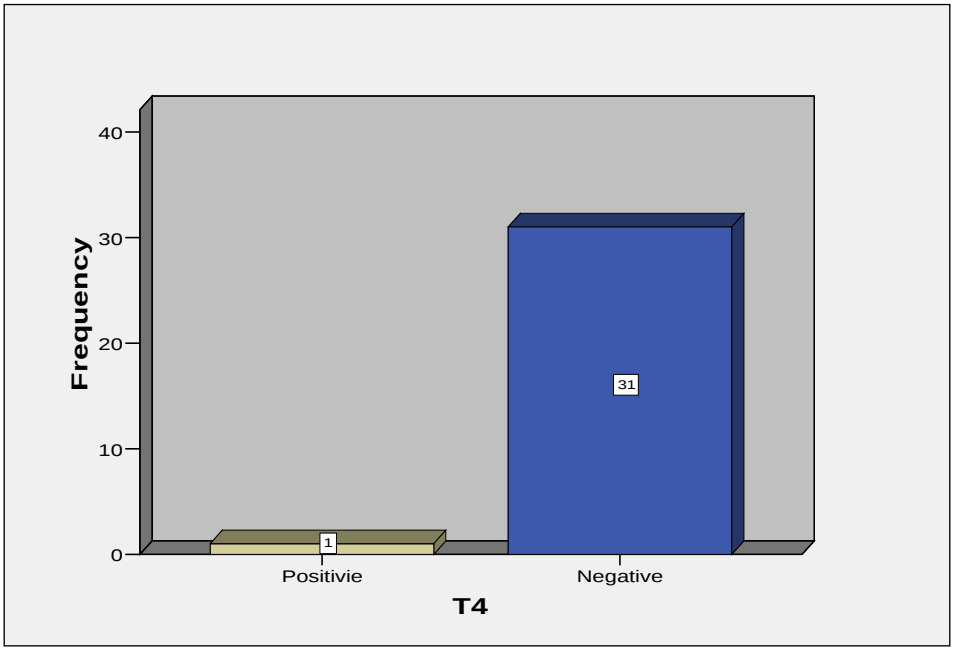



*Figure (4-4) show Positive Family history .*

***Table (4-5) shows Legs varicososis:***

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | +ve | 5 | 15.6 | 15.6 | 15.6 |
| | -ve | 27 | 84.4 | 84.4 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

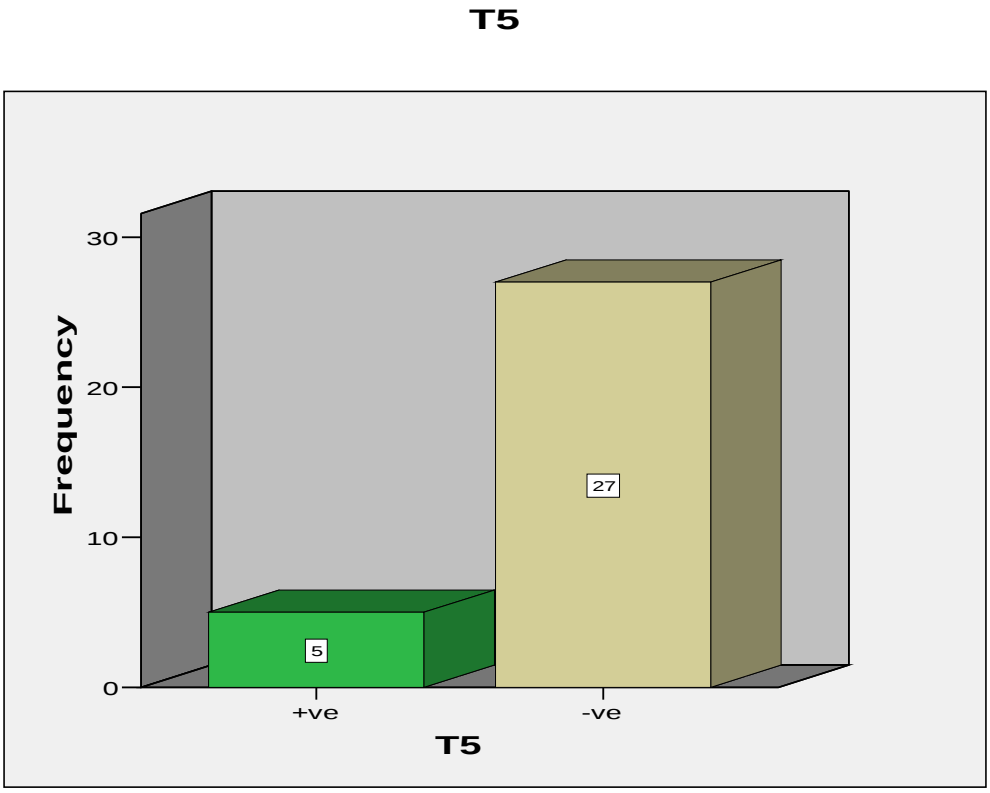



*Figure (4-5) show Legs Varicosis.*

***Table (4-6) shows Positive history of scrotal pain:***

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | +ve | 10 | 31.3 | 31.3 | 31.3 |

| | | | | | |
|---|---|---|---|---|---|
| | -ve | 22 | 68.8 | 68.8 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

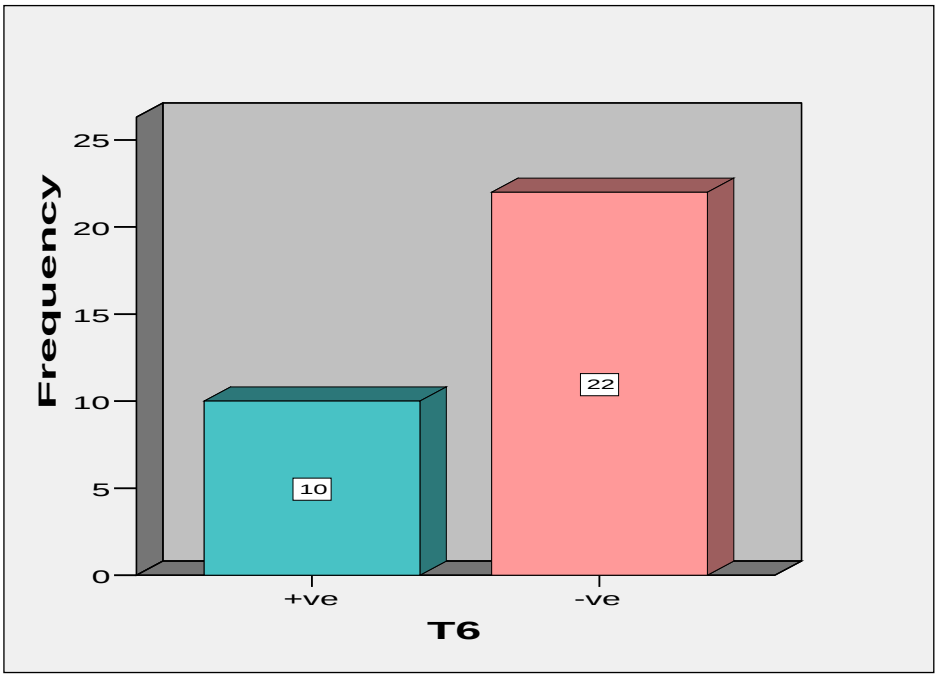



*Figure (4-6) show history of scrotal pain .*

## *Table (4-7) shows the ultrasound finding Rt. And Lt. Varicocele:*

| | | Frequency | | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | +ve | 12 | 37.5 | 37.5 | 37.5 |

| | | | | | |
|---|---|---|---|---|---|
| | -ve | 20 | 62.5 | 62.5 | 100.0 |
| | Total | 32 | 100.0 | 100.0 | |

**T7**

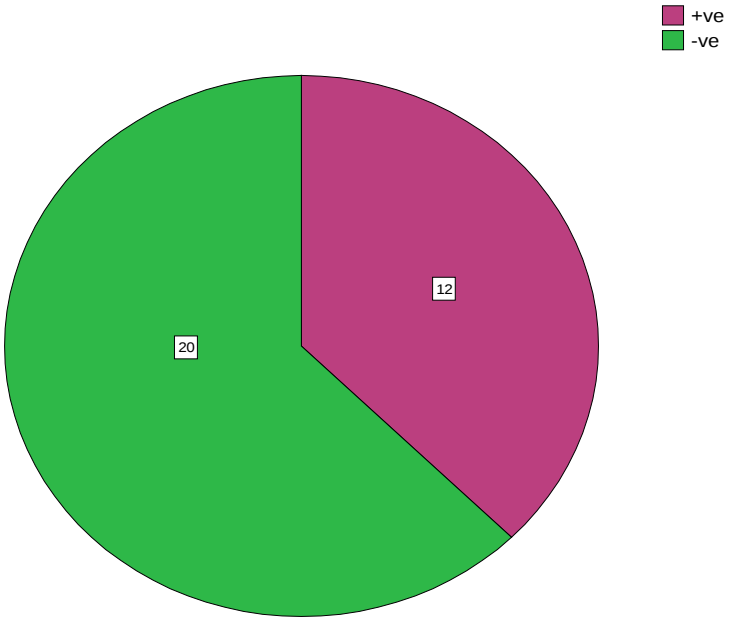
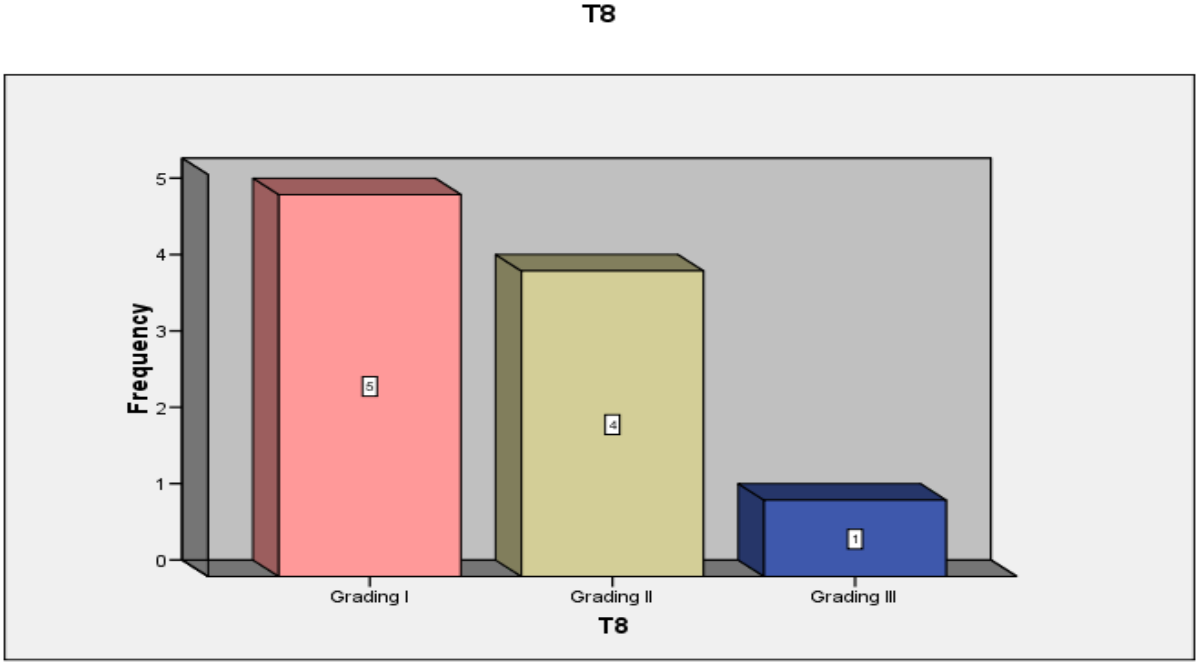



*Figure (4-7) showsultrasoundfinding the Rt. And Lt. Varicocele*

***Table (4-8) shows the ultrasound finding grading of positive Varicocele:***

| | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| Valid | Grade I | 5 | 15.6 | 50.0 | 50.0 |
| | Grade II | 4 | 12.5 | 40.0 | 90.0 |
| | Grade III | 1 | 3.1 | 10.0 | 100.0 |
| | Total | 10 | 31.3 | 100.0 | |
| Missing | System | 22 | 68.8 | | |
| Total | | 32 | 100.0 | | |




*This diagram shows the distribution of three varicocele type's among the positive varicocele*

# Chapter Five

# Discussion, Conclusion & Recommendations

## 5-1 Discussion:

The study of varicocele in Sudanese military students using ultrasound is potential important to find out the relationship between varicocele and long standing situation, however the data of trails is significant is power to demonstrate the problem and the risk and the early detection to increase the response of treatment whether medical or surgical.

The study evaluating the performance the increase of varicocele due to long standing, the Researcher studied thirty two cases of varicocele patients and the following results demonstrate the data collected from the patients:-

- The Researcher indicates the age distribution among the study population and he found that 50% are of 16 years old 20 50% and from 21 to 24 that means the age is not effective.
- Lt. Testicle varicocele is more affected than the Rt. one which correspond to the studies.
- The Positive family history is less effect which we enable us to neglect it (the percentage are 3.1% ).
- Legs varicososis is about 15.6 % that means the long standing to some extent is cause of Legs varicososis.
- That Positive history of scrotal pain.
- The percentage of infection in Rt. testicle varicocele and Lt. testicle varicocele or both is 37.5% which is considered twice the normal average.
- Among the positive cases of varicocele grade Iand grade II more obvious than grade III .

**5-2 Conclusion:**

The study concludes that the Relationship between the long standing and the varicocele and also the Leg varicososis during military exercises ; as fast and reliable method is high needed for early detection of this disease and this could be by ultrasound as effective method of early detection and treatment decision.

The study investigates experimentally 32 cases between the long standing and the infection of varicocele estimating the disease in the patients currently in Ribat Universal hospital in period from January 2016 to April 2016 random sampling technique was used.

A scrotum ultrasound sample for these patients was collected using a linear high frequency ultrasound transducer with color Doppler ultrasound machine.

The data analysis by statistical methods that include the linear and plot as well as bar chart using SPSS.

The main finding of the study can be summarized as following the high infection of varicocele (about 15% --- 20%), and in this study we found the percentage of the infection among the sample which we take from police and law college is 37.5% which mean the great clear effect of the long stand by increasing 100%.

In conclusion, we are sufficiently encouraged the performance of scrotal ultrasound scan for police and law college students for preclinical a large, randomized, trails incorporating the risk as first line test we believe that the improved detection and good prognosis of treatment for varicocele patients.

**5-3 Recommendation:**

• Diminishing the period of  long standing for military students.

• Providing colored ultrasound machine .

• Performance periodical cycle and regular scrotal ultrasound scan for police student for early detection.

• Including the scrotal ultrasound within the medical examination for persons whom are candidate for police and Law College.

• Performance r scrotal ultrasound scan for all police students whom are present now in the college.

• Further Studies with more samples

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D- P.E.S. Palmer.Manual of diagnostic ulterasound. 5thed.WHO; (FRENCE):2003.P(4,5,6).
E- Carol A.Krebs, RDMS , RVT et al.Ultrasound Atlas of Disease Processes. 5thed.Appleton and Lange simon; Norwalk (USA):1997.P(387).
.F- Internet

## (Appendix (1

**جامعة السودان للعلوم والتكنولوجيا**

**كلية الدراسات العليا**

**برنامج ماجستير الموجات الصوتية**

## Demographic sheet

| Particular | | Article |
|---|---|---|
| | :Name | |
| | :Age | |
| Family history | Yes | No |
| Legs Varicosis | Yes | No |
| Scrotal pain | Yes | No |
| Varicocele | Yes | No |

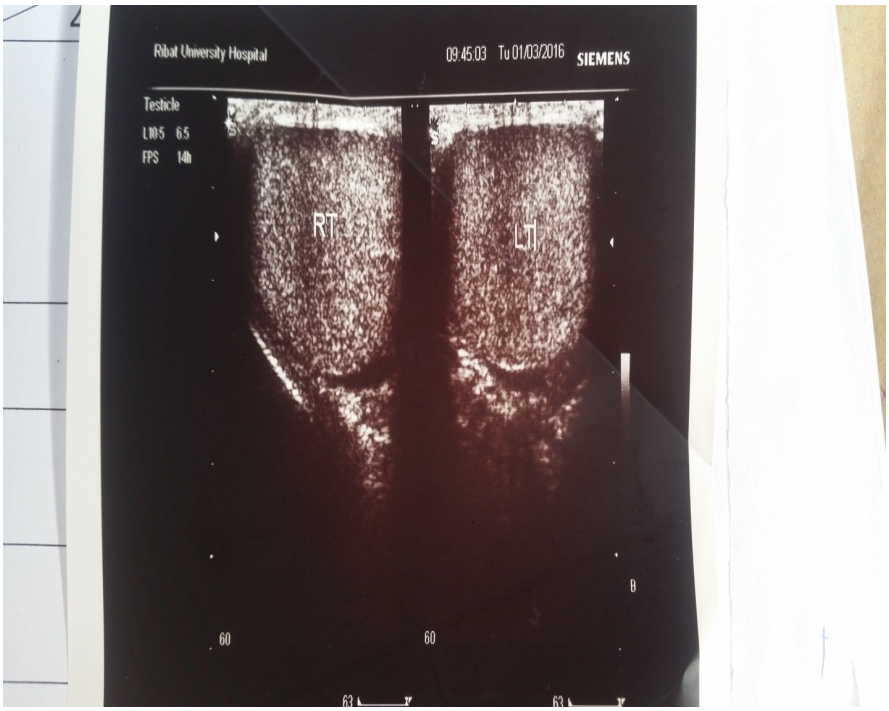
Gsim Allah Yousif  Mohammed Ahmed

## Data Collection Sheet

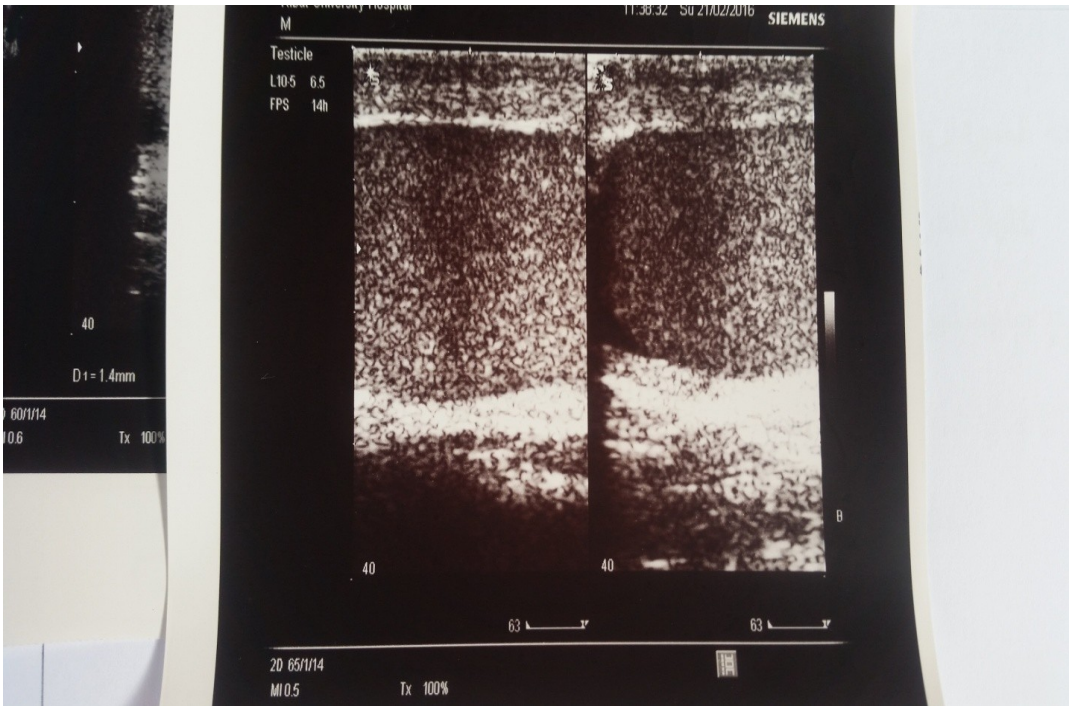
| Rt.testis Varicocele | Lt.testis Varicocele | Scrotal pain | Legs Varicosis | Family History | Age | No. |
|---|---|---|---|---|---|---|
| Yes | Yes | Yes | No | Yes | 21 | 1 |
| Yes | Yes | No | No | No | 20 | 2 |
| Yes | Yes | No | No | No | 20 | 3 |
| Yes | Yes | No | No | No | 22 | 4 |
| Yes | Yes | Yes | No | No | 22 | 5 |
| No | Yes | Yes | Yes | No | 21 | 6 |
| No | Yes | No | No | No | 21 | 7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Yes | Yes | No | No | No | 21 | 8 |
| Yes | Yes | Yes | No | No | 20 | 9 |
| No | No | No | No | No | 20 | 10 |
| No | No | Yes | Yes | No | 24 | 11 |
| No | No | No | No | No | 19 | 12 |
| No | No | Yes | No | No | 21 | 13 |
| No | No | No | No | No | 21 | 14 |
| No | No | No | No | No | 20 | 15 |
| No | Yes | No | Yes | No | 20 | 16 |
| No | Yes | No | No | No | 19 | 17 |
| No | No | No | No | No | 19 | 18 |
| No | No | Yes | No | No | 19 | 19 |
| No | No | No | No | No | 22 | 20 |
| No | No | No | No | No | 22 | 21 |
| No | No | Yes | Yes | No | 22 | 22 |
| No | No | No | No | No | 20 | 23 |
| No | Yes | Yes | No | No | 20 | 24 |
| No | No | No | No | No | 20 | 25 |
| No | No | No | No | No | 23 | 26 |
| No | No | No | No | No | 22 | 27 |
| No | No | No | No | No | 19 | 28 |
| No | No | No | No | No | 20 | 29 |
| No | No | No | No | No | 20 | 30 |
| No | No | No | Yes | No | 21 | 31 |
| No | No | Yes | No | No | 21 | 32 |

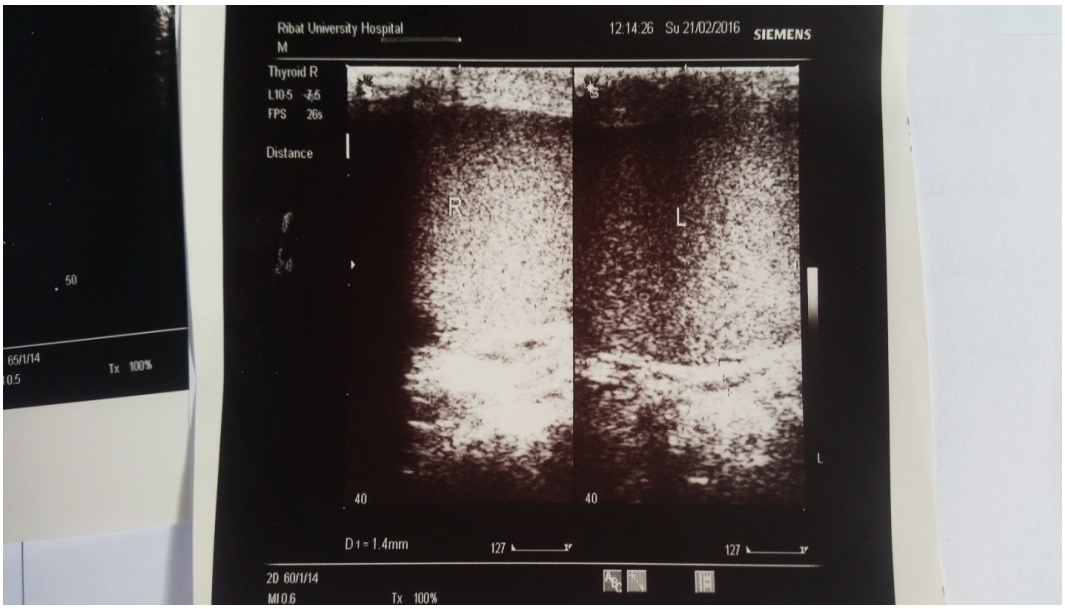
(Appendix (2



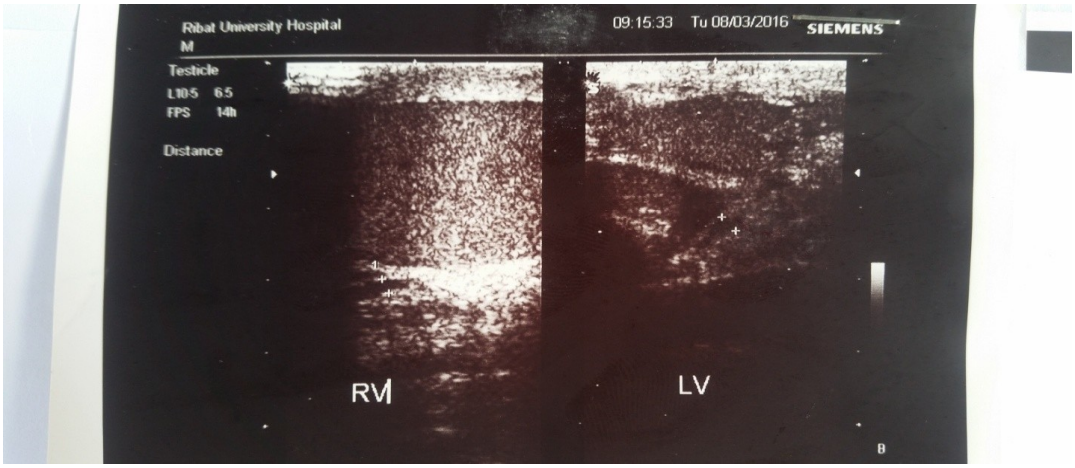

Case No (1). 21 years old known case of legs Variocosisshows normal both testicles.



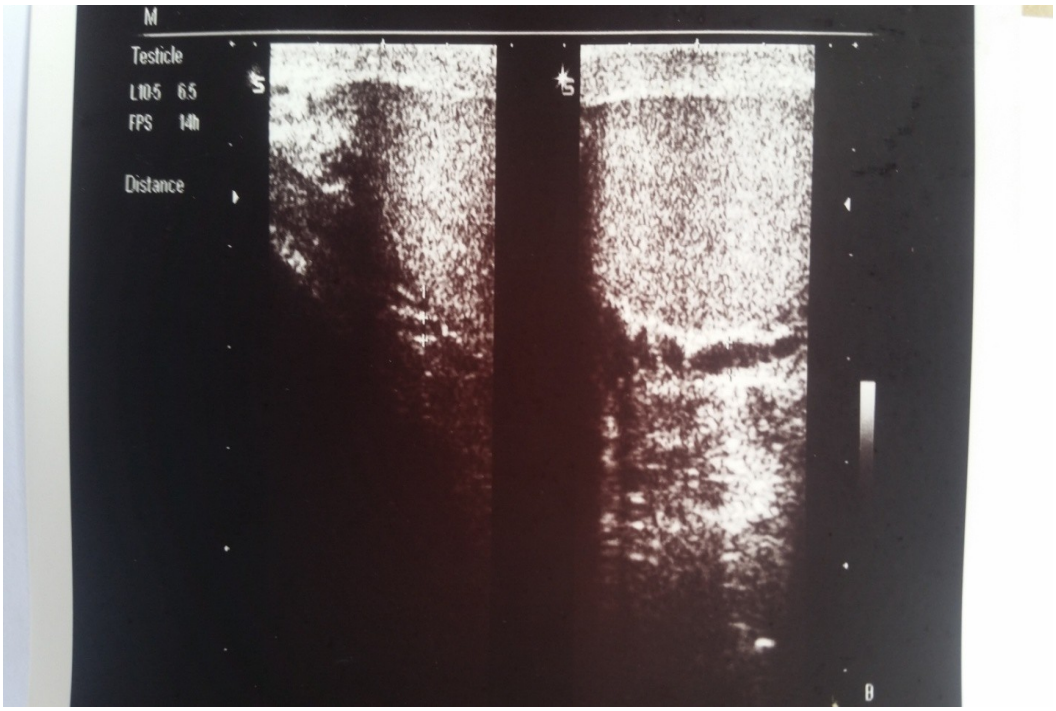
Case No. (2) 20 years old known case of legs Variocosisshows  normal both testicles.



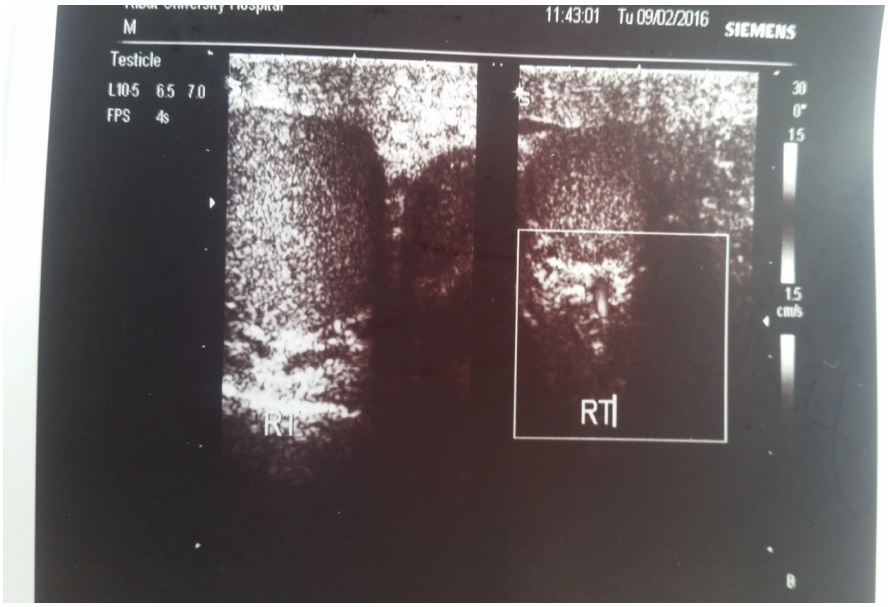

Case No. (3) 20 years oldnormal both testicles

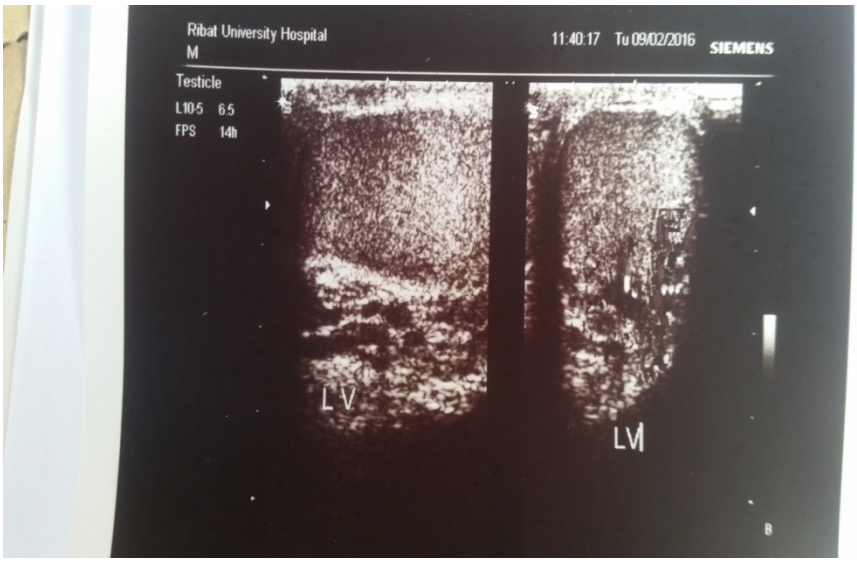



Case No. (4)24 years old known case of legs Variocosis and complain scrotal pain shows Lt.testicle varicocele.

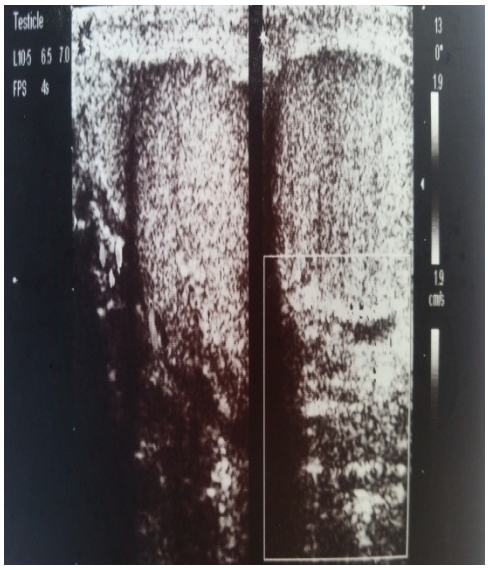


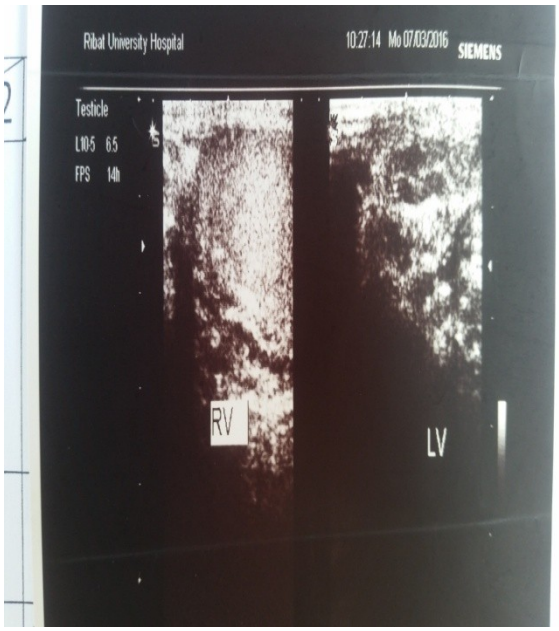

Case No. (5)20 years old shows both testicles varicocele  he complain of scrotal pain.



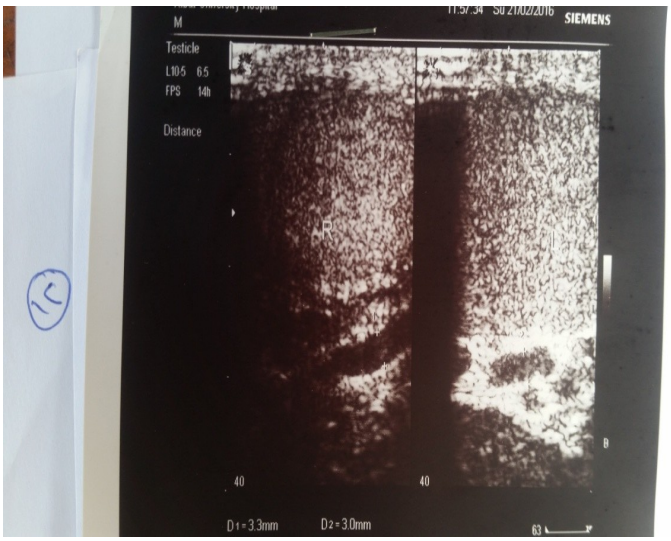


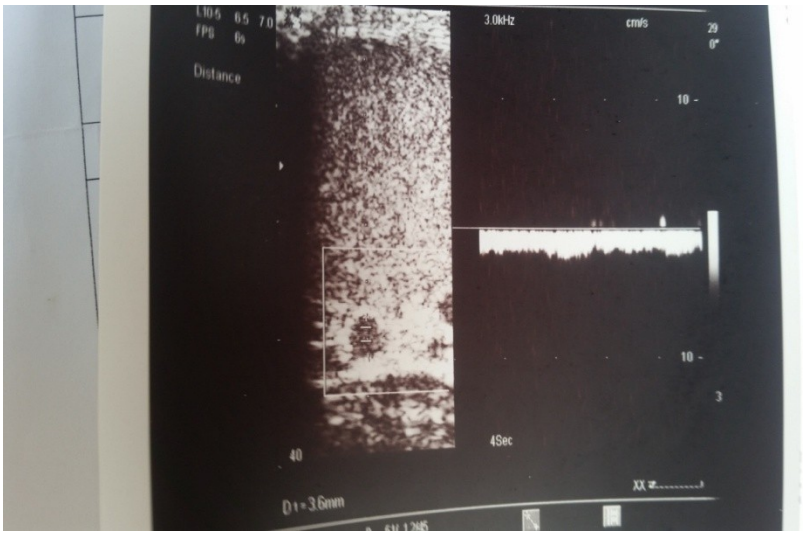

Case No. (6) 21 years oldshows both testicles varicocele .



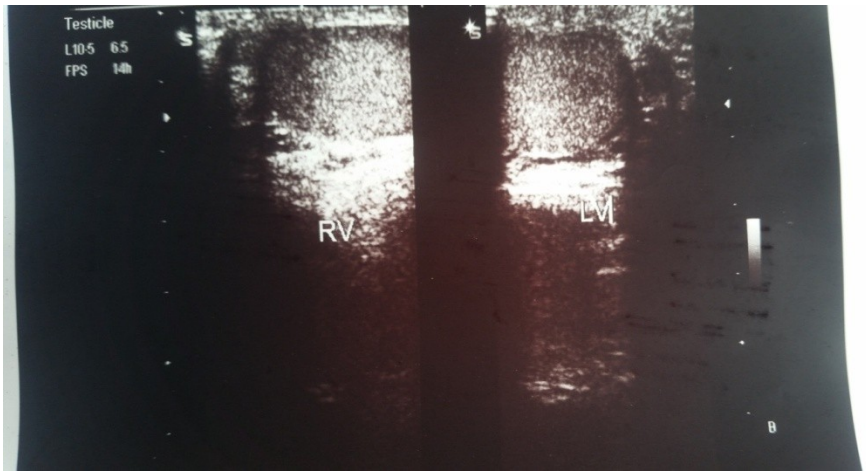



Case No. (7) 21 years oldhas family history of  varicocele and he complain of scrotal pain shows both testicles varicocele.






Case No. (8)21 years old shows both testicles varicocele.




Case No.(9) 19 years oldnormal both testicles.


Case No. (10)20 years old shows both testicles varicocele.