Ultrasound and /Doppler criteria for diagnosis of varicocele are dilatation of veins of pampiniform plexus > 2mm[7,12] and retrograde flow during Valsalva and/or in the up right position regardless the size of pampiniform plexus[13].

Varicocele occurs in 10-15% of adult men[9,10], and Meacham et al stated that the incidence of varicocele in the general population is 13.4% and in patients with hypo fertility 37%[14]. They are more common on the left side[7,9,12,15,16].

There are two types of varicocele: primary and secondary. Primary varicocele is idiopathic and occurs between the ages of 15 and 25 years. They are the most common correctable cause of infertility[12]. The primary varicocele is believed to be due to incompetent valves in the internal spermatic veins[12].

Veins of pampiniform plexus normally have a diameter between 1-2mm; they change little in size with the patient in erect position, with abdominal compression or with Valsalva maneuver.

The primary type of varicocele may disappear with the patient in supine position therefore CDI should be performed in supine and erect position with Valsalva maneuver to detect varices[18]. Secondary varicocele may result from elevated pressure in the internal spermatic vein produced by tumor, hydronephrosis or muscle strain[12,16], they do not disappear with patient in supine position[12], and in this situation the abdomen and pelvis should be scanned carefully to exclude a mass compressing the spermatic veins on the involved side[9,15] .

Methods

A cross sectional study was done on one hundred infertile or hypofertile male patients proved by two seminal fluid analysis and referred by the urologist with clinical suspicion for varicocele and were examined by B-mode and color Doppler ultrasound for confirmation or exclusion of the diagnosis during the period from June 2001 to Nov. 2002 using Siemens versapro color Doppler ultrasound machine.

The physical examination was done by a urologist and was performed in supine and standing position before and during Valsalva maneuver, to give the clinical impression before knowing the results of ultrasound examination.

All patients were selected depending on the history and at least two abnormal seminal fluid analyses in accordance to WHO seminal fluid normal values[19] which are volume = 1.5-5cc, concentration $\geq$ 20 million/cc, motility $\geq$ 50%, and morphology $\geq$ 50%.

Values less than those mentioned above were regarded as abnormal. Laboratory personnel performing the seminal fluid analysis were unaware of the results of physical and ultrasound examination.

Once the physical and seminal fluid examinations were completed, the patient was referred for color Doppler ultrasound examination using linear high-resolution (7.5 MHz) transducer, initially in supine position and the patient was asked to hold his penis suprapubicaly.

For each patient the following steps were carried out by color Doppler ultrasound examination:-

1. Size of each testis: Testicular atrophy was diagnosed when testicular size was less than 3x2 cm depending on Feld and Hricak Criteria[7,9].
2. Parenchyma texture, for exclusion of focal lesion.
3. The epididymes for any sign of inflammation, epididymal cyst or spermatocele.
4. Identification of pampiniform plexus by B-mode and color Doppler ultrasound to assess their size accurately in supine and erect positions.
5. Detection of reversed flow in pampiniform plexus using color Doppler ultrasound in supine and erect positions with Valsalva maneuver.

Results