

Scrotal Varicocele

Subjects: **Hematology**

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Scrotal Varicocele is an abnormal distension (enlargement) of the pampiniform plexus caused by reversed blood flow and/or impaired drainage of the testicular or internal spermatic vein (ISV).

varicocele

pelvic congestion syndrome

1. Introduction

Scrotal varicocele in men represent a relatively frequent pathological condition in the young-adult population, with important implications on quality of life and a significant impact on fertility. In this condition, gonadal venous vessels are abnormally dilated (sometimes secondary to other causes) and flow is slow and retrograde in the gonadal vein.

Traditionally, the resolutive treatment of these pathologies was based on surgery, but in recent decades interventional radiology has taken hold on this topic: there are several reports with large case series and various meta-analyses that demonstrate that, overall, transcatheter endovascular treatments are (at least) not inferior to the surgical approach, both in terms of technical and clinical success, even after prolonged follow-up, and that complications are relatively rare ^[1].

2. Male Varicocele

Male varicocele (MV) is an abnormal distension (enlargement) of the pampiniform plexus caused by reversed blood flow and/or impaired drainage of the testicular or internal spermatic vein (ISV) ^[2].

The incidence of varicocele in young healthy male individuals is 8–23%; it involves the 40% of infertile males ^{[3][4]}. The etiology of male varicocele is multifactorial and there are three main theories to explain the onset of varicocele: (1) the left internal spermatic vein inserts into the left renal vein at an angle of 90° and this angle leads to a higher hydrostatic pressure of ISV; (2) the congenital and/or acquired lack of functioning valves in ISVs which leads to reflux of blood; (3) the compression of the left renal vein (LRV) between the aorta and the superior mesenteric artery (SMA), also known as nutcracker phenomenon ^{[5][6]}. The left side is involved in 75–95% of cases, while the right side in only 5–10% of cases; varicocele is bilateral in 1–15% of cases ^[6].

Male varicocele is associated with alteration of sperm count, motility and morphology, leading to mild and moderate oligospermia, teratospermia or astheno-teratospermia ^[7].

With regards to symptoms, MV is often asymptomatic; local pain (in testicle, scrotum, or groin), varying from sharp to dull discomfort, scrotal heaviness and testicular volume loss are also present in about 2% to 10% [8].

Treatment is indicated in: symptomatic (painful) and palpable (grade 1–3) varicocele, in particular, persistent scrotal pain is an indication for repair, regardless of fertility status [2]; in a subclinical scenario, varicocele repair is not indicated as it does not improve spermatic parameters and does not increase the chance of spontaneous pregnancies [9][10]; in couple infertility, varicocele treatment has proven to be effective in men with oligospermia and unexplained infertility [11] and provides a good opportunity for natural conception [2].

Treatment consists of interruption of reflux through the ISV and its branches superior to the pampiniform plexus. This can be achieved by surgical or percutaneous endovascular techniques [12][13][14][15].

Varicocele endovascular embolization was first proposed in the 1970s and is equivalent to the surgical ISV clipping: with the Seldinger technique, through a neck, groin or arm approach, a diagnostic catheter reaches the renal vein for diagnostic phlebography. After venography demonstrates ISV dilatation and the presence of persistent collateral veins, ISV is gained and the embolic agent is directly delivered [16][17].

The procedure is performed on an outpatient basis under local anesthesia on a tilted X-ray table [15][18]. The presence of collateral veins is the major anatomical factor contributing to treatment failure [19]. Radiologic treatment offers the advantages of causing less patient discomfort and rapid recovery in comparison to the more invasive approach of varicocelectomy [20]. Endovascular treatment offers a lower cost and a lower recurrence rate than surgery and prevents the incision and splitting of the abdominal muscles [14][21][22][23][24].

In addition, surgery does not provide the possibility to visualize the exact varicocele anatomy and collaterals [25]. Concerning open varicocelectomy techniques, high recurrence and complication rates have been reported, with complications ranging from hydrocele formation, testicular artery injury, epididymitis, and vas deferens occlusion, which are otherwise rarely seen in the endovascular approach [26].

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