

*Research Article***Varicocele related orchalgia improvement after varicocele embolization using Histoacryl****Haytham M. Nasser MD* and Mostafa Abdo MD****

* Department of Radiology, Faculty of Medicine, Ain Shams University, Cairo, Egypt,

** Department of General surgery, Faculty of Medicine, Ain Shams University, Cairo, Egypt

Corresponding author: Haytham Mohamed Nasser, Mobile: +201116029306, E-mail address Hmnh1980@gmail.com**Abstract**

Background: Varicocele; dilation pampiniform plexus' veins, occurs in about 15% males. It is also regarded as one of the most frequent causes of infertility in men, with a prevalence of 30%–40% for primary infertility and up to 85% in secondary infertility. **Aim of work:** The purpose of this study is to measure the effectiveness of varicocele embolization using Histoacryl in treating varicocele related moderate and severe orchalgia. **Patients and Methods:** 60 patients were enrolled in our cross sectional study with varicocele presented by moderate to severe pain according to questionnaires evaluating pain scores. Pain scores were evaluated with a 10 point visual analogue score (VAS), 0 = no pain and 10 = worst possible pain. (VAS = 0) → no pain, (VAS = 1–3) → mild pain, (VAS = 4–7) → moderate pain and (VAS = 8–10) → severe pain. Pre and post procedure data were compared. The diagnosis was confirmed by U/S. Patients were operated at Ain Shams University hospitals from December 2016 to May 2017. **Results:** varicocele embolization has significant role in improving pain in those with moderate or severe pain related to varicocele. **Conclusion:** Embolization is an effective way in treating varicocele related orchalgia.

Keywords: Varicocele (VC), Gonadal Vein (GV), Butyl Cyanoacrylate (BC), Primary Infertility (PI), Percutaneous Embolization (PE), visual analogue score (VAS).

Introduction

A varicocele is formed of dilated tortuous veins which are in the pampiniform plexus of veins^[1]. Varicocele is common, 15% of men have varicocele, its prevalence in primary infertility is 35%, and up to 80% in secondary infertility. Although most of men with varicocele have no symptoms at all, however, varicocele is associated with a progressive decline in testicular function as well as orchalgia^[2].

Varicocele can also cause orchalgia, and treatment of varicocele can reduce scrotal pain in case of failure of conservative measures.^[3]

Treatment options for varicocele include both surgical and non surgical methods. The surgical approaches whether inguinal or subinguinal include ligation of all the visualized dilated tortuous spermatic veins sparing the testicular artery. Another surgical option is the use of

laparoscopy to ligate the internal spermatic veins more proximally.

Radiological interventional techniques use venography to identify the gonadal veins as well as the collaterals with subsequent embolization using different techniques and embolizing materials. Varicocele embolization also has a significant role in reducing scrotal pain related to varicocele^[2].

Percutaneous varicocele embolization is a minor procedure that is the least invasive. In contrast to traditional surgical therapies, percutaneous interventional approaches do not require whether incisions or general anaesthesia and thus, can be performed using local anaesthesia. Surgical failure may be the result of pre-existing collateral gonadal veins, Varicocele embolization is therefore better suited to identify and eliminate these collaterals^[4]

The use of venography allows accurate determination of the gonadal veins as well as their collaterals that may have a great impact on the clinical pathology [5].

Another advantage; the trans-venous method virtually eliminates the potential damage to the testicular artery, which in return decrease the complications related to testicular pain and atrophy [2].

Aim of Work

The purpose of this study is to measure the effectiveness of varicocele embolization using Histoacryl in treating varicocele related moderate and severe orchalgia.

Patients and Methods

Patients:

During a period from December 2016, 60 patients were enrolled in the study. All patients with varicocele, diagnosed by ultrasound and scrotal Doppler, 40 patients presented with moderate pain (66.6%) and 20 patients presented with severe pain (33.3%).

Inclusion criteria:

- Patients with unilateral or bilateral varicocele diagnosed by U/S and confirmed during the operation with venography with moderate or severe orchalgia according to visual analogue score.
- No age predilection.

Exclusion criteria

- Bleeding tendency.
- Any contraindication to the injection of contrast: high serum creatinine or allergy.

- Patients with other causes of orchalgia due to testicular torsion, orchitis, epididymitis or trauma were excluded.

Ethical consideration:

- An informed consent is obtained from the patient concerning the complication of the procedure, the complication of the glue and the acceptance to be enrolled in the study.

Ultrasound imaging:

- U/S examination revealed 48 patients to have unilateral left varicocele and 12 patients to have bilateral varicocele.

Severity of pain according to visual analogue score

- 40 patients had moderate varicocele related orchalgia with VAS = 4-7 and 20 patients had severe scrotal pain with VAS =8-10

Statistical analysis

Data were coded and entered using the statistical package SPSS (Statistical Package for the Social Sciences) version 23. Data were summarized using mean, standard deviation, median, minimum and maximum in quantitative data and using frequency (count) and relative frequency (percentage) for categorical data. Comparisons between quantitative variables were done using Chi² and paired t test .

Chi-square test

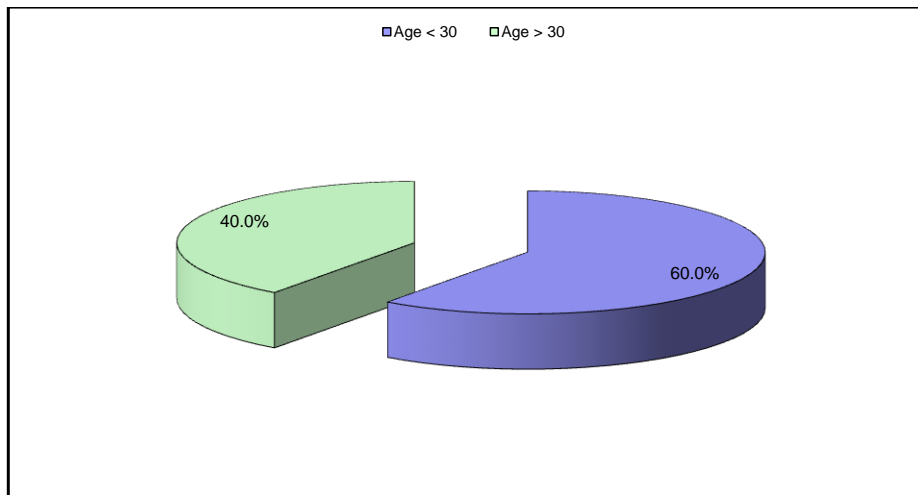
- P-value > 0.05 Non significant
- P-value < 0.05 Significant
- P-value < 0.01 Highly significant

Results

The 60 patients enrolled in this study were ranging from 16 to 42 years with mean age of 29.32 years.

Table (1): Representing the statistical data analysis for different ages enrolled at our study.

Age(years)	No.= 15
Mean ± SD	29.32 ± 8.45
Range	16 – 42
Age< 30	36 (60.0%)
Age> 30	24 (40.0%)



(Diagram-1):Showing that in our study 36 patients were less than 30 years (60%), and 24 patients were older than 30 years (40%).

Presenting complain:

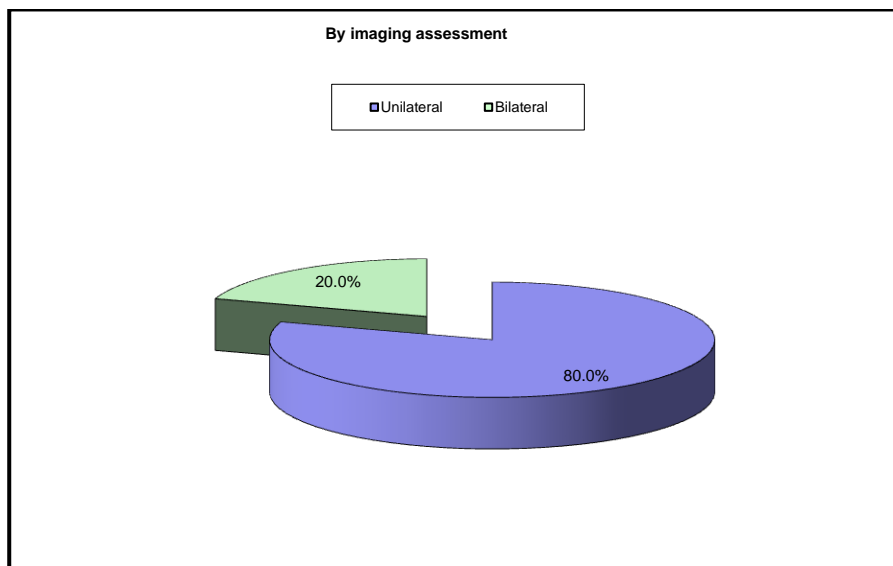
40 patients presented with moderate pain(66.7%) and 20 patients presented with severe (33.3) according to VAS.

Table (2): Demonstrating statistical analysis as regard the clinical indication for varicocele embolization.

Clinical indication		No.	%
Pain	Moderate	40	66.7%
	Severe	20	33.3%
By imaging assessment	Unilateral	48	80.0%
	Bilateral	12	20.0%

By imaging assessment:

All patients were examined by U/S, the examination revealed, 12 of them had bilateral varicocele, 48 cases had unilateral varicocele.



(Diagram-2):Representing the percentage of patient with unilateral varicocele (80 %), and bilateral varicocele (20%).

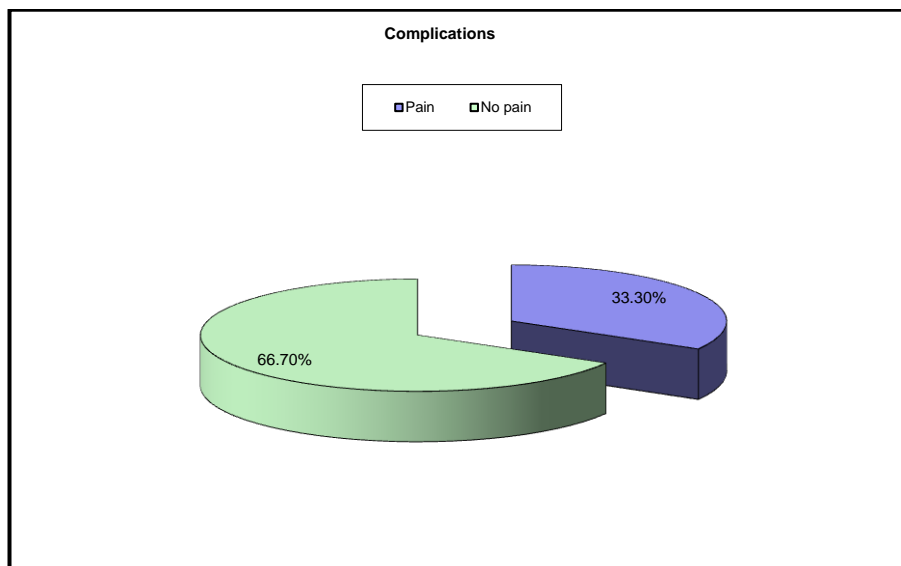
Table (3): Demonstrating the percentage of patients with right and left side varicocele according to the grade.

		No.	%
Right Side Grade	I	4	6.7%
	II	8	13.3%
	III	0	0.0%
Left Side Grade	I	8	13.3%
	II	36	60.0%
	III	16	26.7%

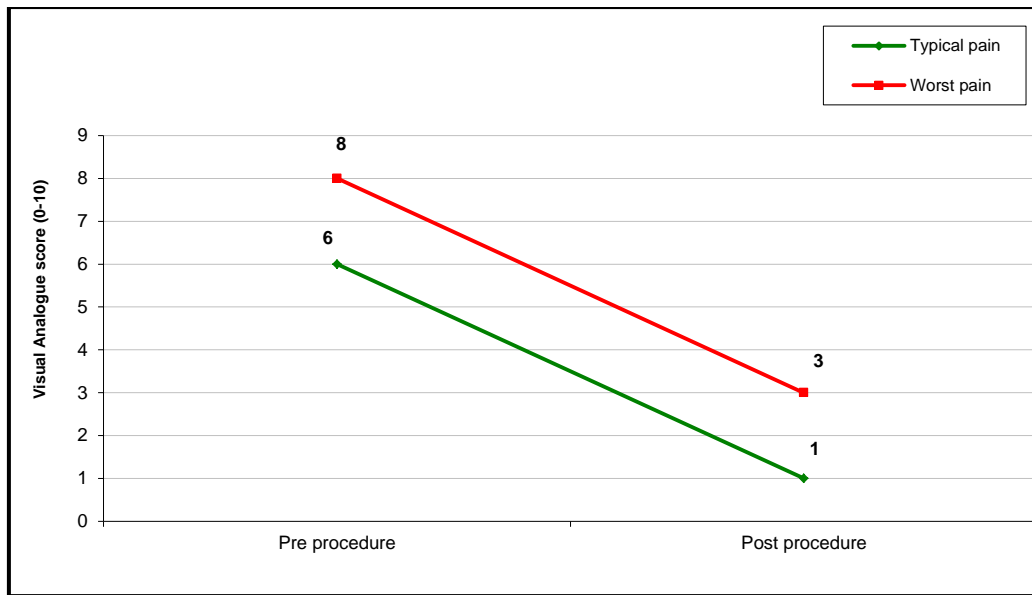
Table (4): Concerning the complications occurred.

		No.	%
Complications	No	40	66.7%
	Yes	20	33.3%
Pain		20	33.3%

It occurred in 20 case (33.3%) in the form of self limited hypochondrial pain after the procedure for one week that resolved over analgesics.



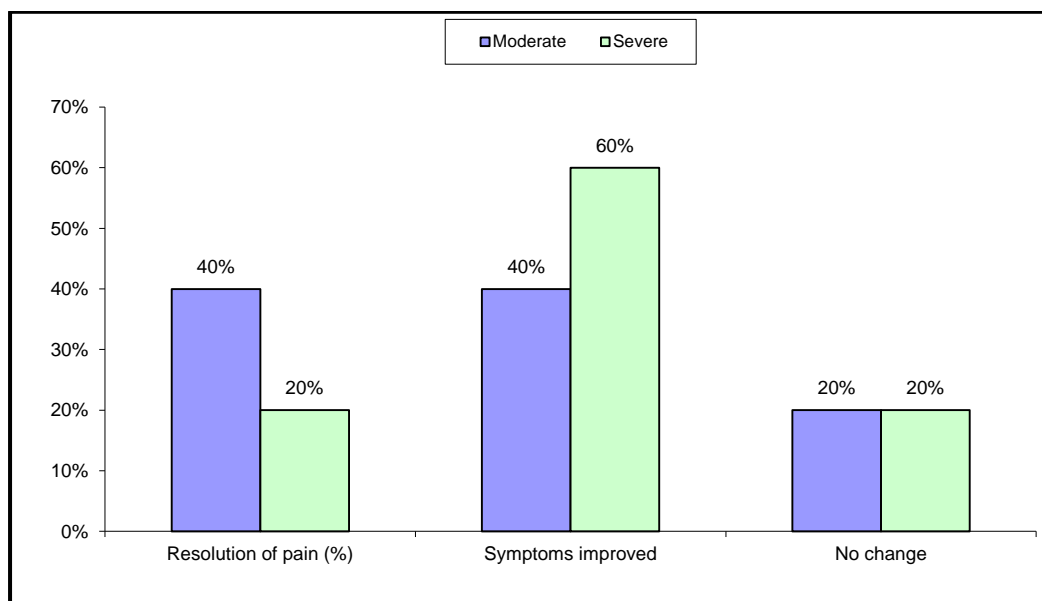
(Diagram-3):Representing the percentage of patients with and without complications.



(Diagram-4): Post-embolisation median pain scores reduced significantly when compared to pre-embolization pain score ($p<0.001$).

(Table 5 & Diagram 5): Varicocele embolization outcomes compared to pre embolization symptom severity

Symptom severity	Resolution of pain (%)	Symptoms improved but not resolved (%)	No change (%)
Moderate	40%	40%	20%
Severe	20%	60%	20%



Discussion

The methods of varicocele repair continue to evolve. Many favour the percutaneous transcatheter technique as a first-line treatment because it is a minimally invasive outpatient procedure and has minimal complication rates^[3].

Many studies investigated the deleterious effects of varicocele on subfertility. However, treatment of varicoceles' related orchalgia through embolization has not been widely investigated. With varicocele being relatively common with significant number experiencing pain, we wanted to guide our patients on the best chance of successful treatment. Standard management of varicoceles' related orchalgia would be a conservative approach including first analgesia and scrotal support. If the conservative measures fail then more invasive treatments are considered such as radiological embolisation or surgical ligation (open, microsurgical or laparoscopic). Till now the role of embolisation for painful varicocele have been unclear, particularly whether technically successful embolisation of the varicocele actually improves pain. We have demonstrated that varicocele embolization can alleviate scrotal pain with an overall reduction of pain in 80% of cases of which 33.3% were cured in both groups. This is relatively comparable with laparoscopic ligation⁽⁵⁾.

Muthuveloe et al., agreed with our results. He performed a total of 96 cases, but used coils instead of Histoacryl. His results were quite similar to us. The reduction in pain according to his study was 74% with 30% of them being completely pain free^[6].

Our data suggests that embolisation success rates for pain seems to work in those with moderate or severe pain, with an improvement of pain in 80% in both groups as well as a complete resolution of pain in 40% and 20% of cases respectively.

Muthuveloe et al., results were quite similar. He mentioned that pain improvement in moderate and severe varicocele related orchalgia were 79% and 81%, of them 38% and 15% respectively were completely cured^[6].

Colour Doppler ultrasound can precisely with a great reliability diagnose varicoceles and even grading it^[7]. Varicocele grade can possibly affect the success rate of treatment. Another consideration which is needed for future researches would be duration of pain prior to embolisation. We were limited on this study, but the pain duration could be an important independent prognostic factor^[6]. A large retrospective study was done for those who had surgical approach via the subinguinal incision for pain. They found that if the pain had been present for more than 3 months then treatment had a higher success rate (98%) compared to patients who had short-term pain of <3 months (82.3%)^[8].

In our study, as regard post procedural complications: 20 of our 60 patients had hypochondrial pain related to the site of gonadal vein embolization that last from 5 days to week that was controlled with analgesics.

Nabi et al., 2004 agreed with our rates of complications as he mentioned that the complications of percutaneous therapy are infrequent and typically mild. Complication rates in recent literature have been reported from 0%, to 5% and 11%^[9].

Limitations of the study:

A limitation of this study is that it's small sample size. It would be beneficial to conduct a comparative study with a larger number with long periods of follow up.

Conclusion

In our study patients complaining of scrotal pain show significant improvement with complete cure in some.

In conclusion, the use of NBCA as an embolic agent for percutaneous treatment of varicoceles' orchalgia is a therapeutic alternative that is effective, safe, simple.

References

1. Wein AJ, Kavoussi LR, Campbell MF, editors. Campbell-Walsh Urology. Philadelphia, PA: Elsevier Saunders; 2012.
2. Halpern J, Mittal S, Pereira K, Bhatia S, Ramasamy R. Percutaneous embolization of varicocele: technique, indications, relative

- contraindications, and complications. *Asian J Androl.* 2016 Mar-Apr;18(2):234-8
3. Puche-Sanz I, Flores-Martin JF, Vazquez-Alonso F, Pardo-Moreno PL, Cozar-Olmo JM. Primary treatment of painful varicocele through percutaneous retrograde embolization with fibred coils. *Andrology* 2014; 2: 716–20.1
 4. Jargiello T, Drelich-Zbroja A, Falkowski A, Sojka M, Pyra K, Szczerbo-Trojanowska M. Endovascular transcatheter embolization of recurrent post-surgical varicocele: anatomic reasons for surgical failure. *ActaRadiol* 2015; 56(1): 63–9.
 5. Kachrilas S, Popov E, Bourdoumis A, Akhter W, El Howairis M, Aghaways I et al., (2014) Laparoscopic varicocelectomy in the management of chronic scrotal pain. *JSLs J Soc Laparoendosc Surg* 18: e2014.00302
 6. Muthuveloe, D.W., During, V., Ashdown, D. et al., SpringerPlus (2015) 4: 392.
 7. Liguori G, Trombetta C, Garaffa G, Bucci S, Gattuccio I, Salamè L et al., (2004) Color Doppler ultrasound investigation of varicocele. *World J Urol* 22:378–381.
 8. Altunoluk B, Soylemez H, Efe E, Malkoc O (2010) Duration of preoperative scrotal pain may predict the success of microsurgical varicocelectomy. *Int Braz J Urol* 36:55–58.
 9. Nabi G, Asterlings S, Greene DR, Marsh RL.:Percutaneous embolization of varicoceles: outcomes and correlation of semen improvement with pregnancy., *Urology.* 2004 Feb; 63(2):359-63.