



RESEARCH ARTICLE

CHARACTERISTICS OF VARICOCELE PATIENTS AFTER VARICOCELECTOMY IN BIOMEDIKA MATARAM HOSPITAL 2018-2020

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ABSTRACT

Background: Varicocele is an abnormal venous dilatation in the pampiniform plexus which affects 15% of the men population in all age groups. An understanding of the characteristics of varicocele patients can help determine the appropriate indication for therapy, so it is very important for the success of varicocele therapy. However, currently, it is still rare to find data that specifically discuss the characteristics of varicocele patients, especially those undergoing varicocelectomy in Mataram. This research is aimed to investigate the characteristic of varicocele patients who underwent varicocelectomy in Biomedika Mataram Hospital from 2018 through 2020.

Methods: This is retrospective descriptive research with a cross-sectional design. The sampling technique used in this research is total sampling which will collect secondary data in the form of medical records of all varicocele patients who underwent varicocelectomy in Biomedika Mataram Hospital from 2018 through 2020.

Results: This research found that varicocele patients who underwent varicocelectomy were mostly in the 26-45 years old age group with 26 patients (65%), with infertility disorder (26 patients; 72,5%). It was also found that 28 patients came with left unilateral varicocele (70%), 15 patients grade I varicocele, and 21 patients abnormal results in semen analysis (52,5%) with the most prevalent interpretation is azoospermia (6 patients; 28,6%). All patients underwent Ivannissevich varicocelectomy (40 patients; 100%), and the number of veins that were ligated during the procedure was 2-5 veins in 30 patients (75%).

Conclusion: Varicocele patients who underwent varicocelectomy were mainly in the 26-45 years old group, has an infertility disorder, left unilateral type, grade I, and an abnormal semen analysis with the interpretation of azoospermia. All of the patients underwent Ivannissevich varicocelectomy with the number of ligated veins was 2-5 veins in most patients.

Keyword: *Varicocele, varicocelectomy, characteristics*

Introduction

Varicocele is a condition caused by abnormally dilated pampiniform plexus in the spermatic funicle.^{1,2} Currently, varicocele has become a common condition affecting around 15% of men population across all age groups.³ The prevalence of varicocele in children,

teens, and the adult population varies widely. Varicocele is more often found in the left testicles rather than the right. This tendency is thought to be caused by anatomical differences between the left and right spermatic veins.^{4,5} Varicocele were commonly asymptomatic, but in some cases, clinical symptoms that may appear in varicocele

patients are pain or discomfort in the scrotum.^{3,6} In men who are diagnosed with varicocele, the incidence of pain is predicted to be as high as 10%.⁶ Besides that, varicocele can also cause infertility. A study in The United States of America (USA) showed that varicocele is the most etiology of infertility in men with a prevalence of 42,2%.⁷

Although some experts have different thoughts on the need for therapy for varicocele patients but based on some indications, therapy in varicocele patients is necessary.^{5,8} Treatment options for varicocele are divided into two main categories which are percutaneous occlusion and ligation surgery. This surgical therapy consists of conventional open varicocelectomy (retroperitoneal ligation, inguinal ligation, and sub-inguinal ligation), laparoscopic varicocelectomy, and microsurgical varicocelectomy.⁹

A comprehensive understanding of varicocele patient's characteristics can help to decide a suitable treatment option, hence playing a significant role in the success of varicocele treatment.¹⁰ However, specific data regarding varicocele patients' characteristics are still scarce, especially in Mataram, West Nusa Tenggara. Therefore, the author was interested in investigating the characteristic of varicocele patients who underwent varicocelectomy in Biomedika Mataram Hospital. This study aims to determine the characteristics of varicocele patients who underwent varicocelectomy at the Biomedika Mataram Hospital for the 2018-2020 period.

Research Methods

This research is a retrospective descriptive study with a cross-sectional design that uses secondary data from the medical records of varicocele patients who underwent varicocelectomy in Biomedika Mataram Hospital from 2018-2020. The research was carried out at the Biomedika Mataram Hospital in September-October 2021. The inclusion criteria were all patients diagnosed with varicocele and had undergone varicocelectomy, and also patients admitted within January 1st 2018 – December 31st 2020. While the exclusion criteria were medical records that were not able to be found. This study used a total sampling technique that all patients who met the criteria were included as the study sample. Collected medical records data were age, clinical manifestation, types of varicocele, severity grade of varicocele, pre-operation semen analysis, type of operation, and the number of the ligated vein during the operation. Collected data will then be analyzed using SPSS Statistics 28 Software and presented in the form of descriptive data. This research has been approved by The Research Ethical Committee of Faculty of Medicine, University of Mataram with No: 250/UN18.F7/ETIK/2021.

Results

Based on the inclusion and exclusion criteria, 40 samples were included in this study. As shown in **Table I**, the included varicocele patients who underwent varicocelectomy in Mataram Biomedika Hospital in 2018-2020 were mostly in the age group of 26-45 years old with 26 patients (65%). The oldest patient was 50 years old while the youngest was 17 years old with an



average of 28,9 years old. Based on the clinical manifestations, most of the included patients showed a clinical manifestation in the form of infertility with 29 patients (72,5%). Based on the type of varicocele, most of the varicocele patients in this research suffer from left unilateral varicocele with 28 patients (70%).

Table 2, illustrates the most prevalent grade of varicocele found in this study were grade I with 15 patients, grade III with 12 patients, and grade II with 11 patients.

Based on the results of pre-operation semen analysis on varicocele patients who

underwent varicocelectomy, most patients showed an abnormal result in the pre-operation semen analysis in 21 patients (52,5%). Out of 21 abnormal patients, most of the interpretations were azoospermia with 6 patients (28,6%) as shown in **Tabel 3**.

All varicocele patients in this study underwent Ivanissevich varicocelectomy surgery, with the number of veins ligated during the varicocelectomy surgical procedure mostly 2-5 veins in 30 patients (75%), >5 veins were ligated in 9 patients (22,5%), and 1 vein was ligated in 1 patient (2,5%). The average number of the ligated vein were 4,4 veins (**Table 4**).

Table 1. Overview of the characteristic of the patients based on age, clinical manifestation, and the type of varicocele

Characteristic	Frequency (n)	Percentage (%)
Age		
0-11 years old	0	0
12-25 years old	13	32,5
26-45 years old	26	65
46-65 years old	1	2,5
> 65 years old	0	0
Total	40	100
Clinical Manifestation		
Asymptomatic	4	10
Testicular pain or discomfort	7	17,5
Infertility	29	72,5
Total	40	100
Types of varicocele		
Unilateral (S)	28	70
Unilateral (D)	2	5
Bilateral	10	25
Total	40	100

Table 2. Overview of the characteristic of patients based on the degree of the varicocele

Type of varicocele		Frequency (n)			
		Grade I	Grade II	Grade III	No grading data is available
Unilateral	Unilateral (S)	11	6	6	5
	Unilateral (D)	1	0	0	1
	Left side	1	2	4	3
Bilateral	Right side	2	3	2	3
Total		15	11	12	12

Table 3. Overview of the pre-operation semen analysis results in varicocele patients who underwent varicocelectomy

Semen Analysis Result	Frequency (n)	Percentage (5)
Pre-operation semen analysis		
Normal	0	0
Abnormal	21	52,5
No Data	19	47,5
Total	40	100
Abnormal Semen Analysis		
Oligozoospermia	0	0
Astenozoospermia	0	0
Teratozoospermia	5	23,8
Oligoastenozoospermia	0	0
Oligoteratozoospermia	3	14,3
Oligoastenoteratozoospermia	3	14,3
Azoospermia	6	28,6
Severe Oligospermia	1	4,8
Cryptozoospermia	2	9,5
Leukositospermia	1	4,8
Total	21	100

Table 4. Overview of characteristics based on the type of operation and the amount of ligated vein during the varicocelectomy operation

Characteristic	Frequency (n)	Percentage (5)
Type of Operation		
Palomo Varicocelectomy	0	0
Ivanissevic Varicocelectomy	40	100
Total	40	100
Ligated vein during operation		
1 vein	1	2,5
2-5 veins	30	75



>5 veins	9	22,5
Total	40	100

Discussion

Based on the presented result, it was found that most of the patients were in the age group of 26-45 years old with a percentage of 65%, which was categorized according to the Health Department of The Republic of Indonesia as an adult. A different result was obtained by Parisudha & Suwedagatha in 2019 which showed an average age of 20 years old with most of the patients were between the age of 15 and 24 years old with a percentage of 89,5%.¹¹ This difference is thought to be caused by the fact that most patients in the Parisudha & Suwedagatha were police candidates and police officers who underwent a medical checkup with lower average age and without any specific complaints while most of the participants of this research were admitted to the hospital because of their specific complain such as infertility. A study done by Mustika et al in 2014 showed the frequency of patients with left unilateral varicocele based on age. That study found that the highest incidence in the age of 16-20 years old with the percentage of 99,34% and the varicocele were mostly detected because of mandatory job requirement medical checkups.¹²

Most of the varicocele patients in this research showed a clinical manifestation in the form of infertility with 29 patients (72,5%). Results in this research were in line with a study published by Purnomo which concluded that in varicocele patients, they usually come to visit a doctor with a chief complaint related to infertility or haven't got any kids after years of marriage.⁵ These results were in accordance with the indications of varicocelectomy according to Chan (2011) which were fertility especially if

an abnormality in the semen or sperm analysis result was obtained.⁹ Different results were obtained in the study by Parisudha & Suwedagatha which showed that most of the varicocele patients were asymptomatic with a percentage of 90,5%.¹¹ This difference is thought to be caused by the different characteristics of the population. In Parisudha & Suwedagatha's study, most of the research participants were police and police candidates who underwent a medical checkup and hence have no complaints or are asymptomatic. While the participants of this research were people with a specific complaint regarding varicocele which was infertility.

Based on the type of varicocele, most of the participants of this research were left unilateral varicocele with 28 patients (70%). This result is in accordance with the theory that left varicocele is more prevalent than right varicocele with 78-93% of the cases.¹³ In theory, this is thought to be caused by the fact that the left internal spermatic vein ends up in the left renal vein with a perpendicular angle, while the right internal spermatic vein enters the vena cava with an oblique angle. Besides, the left internal spermatic vein is considerably longer than the right one with fewer and incompetent valves.⁵ Research published by Dadhich & Meena and by Alkhamees et al in 2020 showed that most of the varicocele patients were left unilateral varicocele.^{14,15} Different result was obtained by a study done by Gat et al in 2004 which showed the most prevalent type of varicocele were bilateral varicocele with the percentage of 80,8%.¹⁶ This different result is thought to be caused by different diagnosis modalities which were used in both of those research. This research utilizes physical exam and



scrotal ultrasonography examination while in the research done by Gat et al, they used venography which has a higher sensitivity.

Grade I varicocele was the most prevalent severity of varicocele found in this research. Similar results were found in a research published by Soylemez et al in 2012 which showed that the most prevalent grade of varicocele was grade I.¹⁷ Different results were obtained by Kwon & Lee in 2014 which showed that most of their participants were grade III varicocele with 87 patients and the percentage of 68%.¹⁸ In line with Kwon & Lee, Parisudha & Suwedagatha in 2019 also showed that the most prevalent severity of varicocele in their participants was grade III varicocele with 78 patients and the percentage of 82,1%.¹¹

Based on the pre-operation semen analysis, 21 patients with varicocele who underwent varicocelectomy (52,5%) of the obtained data were abnormal while the rest of the participant's data cannot be retrieved. This result is in accordance with several literature which stated that dilatation of pampiniform plexus will cause an increase in temperature of the testis and eventually disturbed spermatogenesis. This indicates that varicocele can have a devastating effect on the function of the testis, hence men with varicocele will usually have a lower semen quality than those who don't have varicocele.^{7,8} Similar results were obtained by Majzoub et al in 2016 which showed that most of the patients has an abnormal semen analysis result (332 patients; 87,7%).¹⁹

Out of 21 patients who showed an abnormal result in the pre-operation semen analysis, it was obtained a high variability of further analysis. Most of the results were azoospermia in 6 patients (28,6%). A different

degree of variation was obtained by Rizaldi & Alif in 2013 which showed that the most prevalent result in the pre-operation semen analysis of varicocele patients was oligoasthenozoospermia with a percentage of 23,2%.²⁰ This difference is thought to be related to the degree of damage in the testicle function caused by varicocele in individual patients. One of the factors affecting testicular function in varicocele was the degree of varicocele. According to research published by Ariyati et al in 2017, there was indeed a significant correlation between the degree of varicocele with sperm morphology, sperm concentration, and sperm motility in varicocele patients.²¹

All varicocele patients in this study underwent varicocelectomy surgery with an inguinal incision approach (Ivanissevich). A similar result was obtained in Parisudha & Suwedagatha in 2019 which showed that most of the patients underwent Ivanissevich varicocelectomy (72,8%). A different result was obtained in another research published by Mustika et al in 2014 and by Rizaldi & Alif in 2013 which showed that all patients that underwent a varicocelectomy procedure in their research utilize a Palomo technique.^{12,20} According to Parisudha & Suwedagatha, the difference in the proportion of techniques used in the varicocelectomy procedure may be due to the preferences of each surgeon and different comorbidities.¹¹

This study also collect data regarding the number of the ligated vein during the procedure. Results showed that 2-5 ligated veins were the most prevalent with 30 patients (75%). Similar results were obtained by research published by Pasqualotto et al in 2005 which showed that in most of their participant who underwent a varicocelectomy procedure, ≤ 5 veins (46%) were the most



prevalent.²² Different results were obtained in research published by Majzoub et al in 2016. In that research, 5-10 veins were the most prevalent number in their patients which accounts for 48,7% of their participants.¹⁹ The number of veins that were found during operation varies widely and has no correlation with the clinical degree of the varicocele.²³ The number of the spermatic vein which was ligated during the operation has a significant correlation with the pre-operation ultrasonography findings. Besides that, the number of veins that were found during the procedure was also affected by the location of the incision or the approach used by the operator, which means that the lower the incision, the more veins will be found.¹⁹

Conclusion

Based on the data analysis and discussion in this research, it can be concluded that the characteristic of varicocele patients who underwent varicocelectomy in Mataram Biomedika Hospital in 2018-2020 was dominated by patients in the age of 26-45 years old with an average age of 28,9 years old with mostly infertility-related chief complaints. While based on the type of varicocele, the most prevalent type was left unilateral varicocele, and based on the severity or grading of the varicocele, the most prevalent ones were grade I varicocele. In the current research, it was obtained that in the varicocele patients who underwent varicocelectomy, most of them has an abnormal result in the pre-operational semen analysis with a further analysis resulted in mostly azoospermia. All varicocele patients in this study underwent varicocelectomy surgery with an inguinal incision approach (Ivanissevich) and the number of veins ligated during the procedure was mostly 2-5 veins.

CONFLICT OF INTEREST

The authors state that there is no conflict of interest in this study.

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