

Adolescent Varicocele

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Abstract

Introduction: Adolescent varicocele is still a controversial issue in pediatric urology. In this study, we aimed to evaluate adolescent patients with varicocele, who were operated in our clinic, in the light of literature. **Materials and Methods:** The data of adolescent patients who underwent varicocelectomy between January 2012 and January 2018 in the Urology Clinic of Malatya Training and Research Hospital were examined retrospectively. The age and admission complaint of the patients, the localization of varicocele, the varicocele grade determined by color Doppler ultrasound (US), the presence of testicular atrophy, the height, weight, body mass index of the patients as well as their relationship with each other were evaluated. **Results:** The mean age of the patients is 14.74 years (10 - 17 years). Of the patients, 153 (92.2%) had a left-sided varicocele and 13 (7.8%) had a right-sided varicocele. When admission complaints of the patients were examined, 31 (18.6%) had scrotal pain, 53 (32.2%) had scrotal swelling, 21 (12.6%) had skin bruising, 40 (24%) had dilated veins recognized by the family, and 21 (12.6%) had more than one complaint. When the relationship between varicocele grade and BMI was examined, 13 (35.1%) of the 37 patients with a grade 2 varicocele were lean, 23 (62.1%) were normal weight, and 1 (2.8%) was obese. 12 (17.7%) of the 68 patients with a grade 3 varicocele were lean, 54 (79.4%) were normal weight, and 2 (2.9%) were overweight. 8 (13.1%) of the 61 (36.7%) with a grade 4 varicocele were lean, 46 (75.5%) were normal weight, and 7 (11.4%) were overweight. **Conclusion:** Adolescent varicocele is still one of the controversial issues today; the diagnosis should be made with the help of physical examination and radiological tests besides the family's application in boys in this age group in order to prevent possible problems.

Keywords

Adolescent, Varicocele, Body Mass Index

1. Introduction

Varicocele is defined as dilatation of the spermatic veins and the plexus pampi-

niformis which is a scrotal extension of these veins [1]. Although it is rarely seen in the prepubertal period, it increases during puberty. It peaks around the age of thirteen. This rate increases up to 15% between ten and nineteen years of age. This rate is similar to the rates in adults [2] [3]. Several rates on the prevalence of adolescent varicocele have been reported in the literature. These rates have ranged from 9% to 42.8% [4] [5]. Adolescent varicocele is still a controversial issue in pediatric urology [6]. Children and adolescents with varicocele may experience fertility problems in the future. Therefore, it is still being discussed that they need to undergo surgical treatment and can benefit from this treatment [7]. In this study, we aimed to evaluate adolescent patients with varicocele, who were operated in our clinic, in the light of literature.

2. Materials and Methods

The data of adolescent patients who underwent varicocelectomy between January 2012 and January 2018 in the Urology Clinic of Malatya Training and Research Hospital were examined retrospectively. The age and admission complaint of the patients, the localization of varicocele, the varicocele grade determined by color Doppler ultrasound (US), the presence of testicular atrophy, the height, weight, body mass index of the patients as well as their relationship with each other were evaluated.

3. Results

The mean age of the patients is 14.74 years (10 - 17 years). Of the patients, 153 (92.2%) had a left-sided varicocele and 13 (7.8%) had a right-sided varicocele. All patients underwent preoperative color Doppler US. According to examination with color Doppler US, 37 (22.4%) had a grade 2 varicocele, 68 (40.9%) had a grade 3 varicocele, and 61 (36.7%) had a grade 4 varicocele. 18 (10.8%) had testicular atrophy. When admission complaints of the patients were examined, 31 (18.6%) had scrotal pain, 53 (32.2%) had scrotal swelling, 21 (12.6%) had skin bruising, 40 (24%) had dilated veins recognized by the family, and 21 (12.6%) had more than one complaint. While 142 patients had a negative family history of varicocele, 24 patients had a positive family history of varicocele (**Table 1**). The mean body weight of the patients was 47.2 kg (23 - 68 kg), and the mean height of the patients was 151 cm (124 - 171 cm). According to body mass index (BMI), 33 patients were lean, 123 patients were normal weight, 9 patients were overweight, and 1 patient was obese. When the relationship between varicocele grade and BMI was examined, 13 (35.1%) of the 37 patients with a grade 2 varicocele were lean, 23 (62.1%) were normal weight, and 1 (2.8%) was obese. 12 (17.7%) of the 68 patients with a grade 3 varicocele were lean, 54 (79.4%) were normal weight, and 2 (2.9%) were overweight. 8 (13.1%) of the 61 (36.7%) with a grade 4 varicocele were lean, 46 (75.5%) were normal weight, and 7 (11.4%) were overweight (**Table 2**). When the relationship between varicocele grade and admission complaint was examined, 15 (40.5%) of the 37 patients with a grade 2

Table 1. Admission complaint.

Scrotal Pain	31 (18.7%)
Scrotal Swelling	53 (31.9%)
Skin Bruising	21 (12.7%)
Recognition of Dilated Veins	40 (24%)
More than one Complaint	21 (12.7%)
Total	166

Table 2. Relationship between varicocele grade and BMI.

	GRADE 2	GRADE 3	GRADE 4
Lean	13 (35.1%)	12 (17.7%)	8 (13.1%)
Normal	23 (62.1%)	54 (79.4%)	46 (75.5%)
Overweight	-	2 (2.9%)	7 (11.4%)
Obese	1 (2.8%)	-	-
Total	37 (100%)	68 (100%)	61 (100%)

varicocele had scrotal pain, 16 (43.2%) had scrotal swelling, and 6 (16.3%) had skin bruising. 16 (23.5%) of the 68 patients with a grade 3 varicocele had scrotal pain, 32 (47%) had scrotal swelling, 10 (14.7%) had had skin bruising, 7 (10.2%) had dilated veins recognized by the family, and 3 (4.6%) had more than one complaint. 5 (8.1%) of the 61 (36.7%) with a grade 4 varicocele had scrotal swelling, 5 (8.1%) had skin bruising, 33 (54%) had dilated veins recognized by the family, and 18 (29.8%) had more than one complaint (**Table 3**).

4. Discussion

Varicocele is defined as dilatation of the spermatic veins and the plexus pampiniformis which is a scrotal extension of these veins. The right internal spermatic vein is approximately 10 cm shorter than the left internal spermatic vein and drains directly into the vena cava inferior. Therefore, it creates a hydrostatic pressure difference and sets the ground for the formation of varicoceles. Varicocele is frequently observed on the left side when the literature is examined. It is rarely seen on the right side or both sides [8] [9]. In our study, the majority of patients had a left-sided varicocele in accordance with the literature.

In recent years, scrotal color Doppler ultrasound is frequently used to determine the degree of varicocele and venous reflux [10]. Our patients underwent color Doppler ultrasound. The majority of these patients had a grade 3 varicocele. It is important to assess the testicular volume in patients with high-grade varicocele. Ultrasound is used to determine this volume. In ultrasonographic measurement, the length, width and height of the testis are measured in mm, and the testicular volume is calculated by the Lambert formula ($TV = 0.71 \times \text{width} \times \text{length} \times \text{height}$) [11]. It has been shown that the Lambert formula gives

Table 3. Relationship between varicocele grade and admission complaint.

	GRADE 2	GRADE 3	GRADE 4
Scrotal Pain	15 (40.5%)	16 (23.5%)	-
Scrotal Swelling	16 (43.2%)	32 (47%)	5 (8.1%)
Skin Bruising	6 (16.3%)	10 (14.7%)	5 (8.1%)
Recognition of Dilated Veins	-	7 (10.2%)	33 (54%)
More than one Complaint	-	3 (4.6%)	18 (29.8%)
Total	37	68	61

more accurate results when compared to other volume measurements [12]. Testicular volume differential (TVD) is calculated by the following formula: volume of unaffected testis – volume of affected testis/total testicular volume × 100(%). Testicular atrophy index (TAI) is calculated by the following formula: volume of unaffected testis – volume of affected testis/volume of unaffected testis × 100(%) [13] [14]. The presence or absence of testicular atrophy is calculated in this way. Testicular hypotrophy is defined as testicular volume below 2 ml by ultrasound and more than 20% difference in testicular volume relative to the contralateral testis [15]. Testicular hypotrophy is among the indications for surgery [16]. In our study, approximately 1/10 of the adolescent patients who underwent surgery due to varicocele had testicular atrophy.

Although varicocele in childhood and adolescence is typically asymptomatic, few patients have symptoms and complaints. They seldom present with pain and are sometimes detected due to dilated veins and skin bruising recognized by the family. Sometimes, they are detected when parents recognize the difference between the two testes and thereby bring their children to the clinical examination [10] [17] [18] [19]. In our study, the most common admission complaint of the patients was scrotal swelling. This was followed by dilated veins recognized by the family and local skin bruising.

The incidence of varicocele in the patients whose first-degree relatives (such as a father or brother) had varicocele was found to be 3 - 4 times higher than the normal population [20] [21]. In our study, 24 (14.4%) of the patients had a positive family history of varicocele.

The relationship between adolescent varicocele, weight and BMI is still unclear [22]. Although some studies have revealed a positive correlation between the incidence of adolescent varicoceles and weight gain, it has been shown to be inversely proportional to reduced body mass index [23]-[28]. When the literature is examined, various studies have shown that the incidence of varicocele is decreased in overweight and obese men [29] [30] [31] [32]. In a large-scale study by Liu *et al.*, it was shown that varicocele grade was decreased with reduced body mass index [22] [28]. In our study, while the patients with a low BMI had a low-grade varicocele, the patients with a high BMI had a high-grade varicocele.

When the literature is examined, there are a limited number of studies assessing the relationship between varicocele grade and BMI. These studies have been

conducted on adults. Fazeli *et al.* found that the patients with a low BMI had a high-grade varicocele [33]. In our study, it was seen that varicocele grade increased as BMI increased.

Varicocele causes progressive damage to the testis through various mechanisms and can lead to infertility. Although adolescent varicocele is still one of the controversial issues today, the diagnosis should be made with the help of physical examination and radiological tests besides the family's application in boys in this age group in order to prevent possible problems. We think that a large number of studies are needed in order to clarify the relationship of adolescent varicocele with demographic characteristics.

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