

MEASUREMENT OF TESTICULAR VOLUME BY ULTRASONOGRAPHY*

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SUMMARY: Arıtürk E, Özateş M. (Departments of Pediatric Surgery and Radiology, Dicle University Faculty of Medicine, Diyarbakır, Turkey). Measurement of testicular volume by ultrasonography. Turk J Pediatr 35: 177-180, 1993.

Twenty-five patients with scrotal hernia and hydrocele were studied. The testicular sizes of the patients were measured by using ultrasonography and the sliding caliper was used for calculations during surgery. The actual testicular volumes and those obtained by ultrasonography were not statistically different ($p > 0.05$). It is suggested that ultrasonography may be an alternative to orchidometers. *Key words: scrotal ultrasonography, testicular volumes.*

In the past ten years, ultrasonography (USG) has been an essential method for diagnosing urological diseases. The use of high frequency real-time probes facilitates the visualization of superficial organs. Ultrasonography is most useful in evaluating the causes of chronic symptoms and scrotal enlargement, however, acute conditions can also be investigated by using this method with some success¹. In addition, USG may also provide valuable information on testicular size^{2,3}. Testicular volume may be calculated clinically measuring the length and width of the testis, and then using the formula devised by Lambert ($0.71 \times L \times W^2$)^{4,5}.

This study was undertaken with the aim of comparing the actual testicular volume with the volume obtained by using ultrasonography.

Material and Methods

Twenty-five patients with the diagnosis of hydrocele and scrotal hernia comprised the study population. Ultrasonography was performed on all patients the day before surgical intervention. The testicular volume was calculated by measuring the length and width of the testis seen on the scan. All scans were done with a Toshiba diagnostic real-time scanner and a 7.5 MHz linear transducer (Fig. 1). The testicular volume was calculated by using the above-mentioned formula. The measurements were taken by only one observer and the testes were measured

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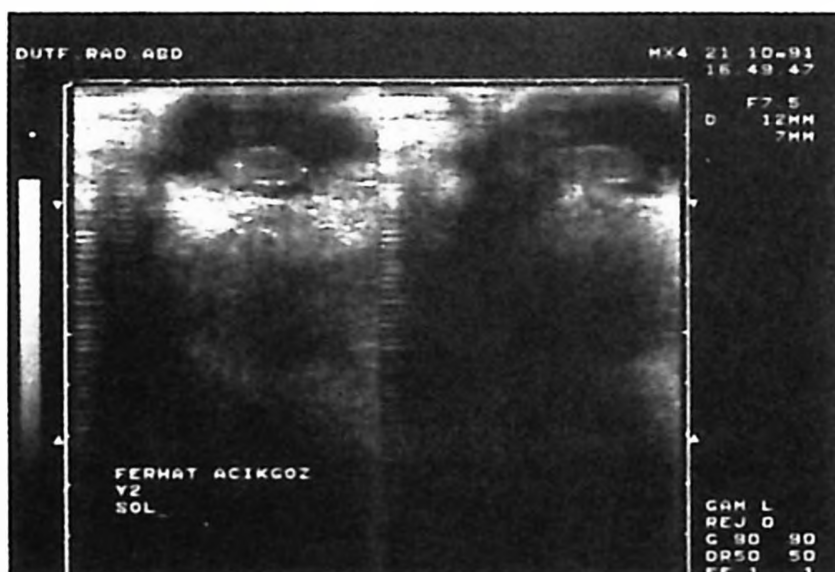


Fig. 1: Ultrasonographic appearance of the testis.

three different times. The actual testicular volumes were assessed in the operating room. The testicular size was determined by the use of a sliding caliper during routine herniorrhaphy or hydrocelectomy (Fig. 2). The actual testicular volume was calculated by using the formula, $0.71 \times L \times W^2$. The Student's t test was used to compare the mean sonographic testicular volumes with the actual volumes of the testes.



Fig. 2: Calculation of the actual testicular size by using the sliding caliper during surgery.

Results

The actual testicular volumes and those obtained by using USG are presented in Table 1. The paired Student's t test revealed no differences between the groups ($p > 0.05$).

Table I: Ultrasonographic and Actual Measurements of the Testicular Size and Volume

Case & Age			Length (mm)		Width (mm)		Volume ($0.71 \times L \times W^2$) (mm ³)	
			US	Act	US	Act	US	Act
NA	5	yrs	19	19.4	11	12.1	1632.29	2016.65
CM	2.5	yrs	18	17.5	7	6.8	626.22	574.53
EA	2.5	yrs	14	13.8	11	10.5	1202.74	1080.23
SL	10	yrs	20	19.8	10	9.8	1420	1350.13
GP	2.5	yrs	14	14.6	7	7.2	487.06	537.37
OSA	15	yrs	22	21.8	11	11.5	1890.02	2046.97
YT	2.5	yrs	12	12.4	6	6.9	306.72	419.16
CA	12	yrs	16	15.6	12	11.8	1635.84	1542.22
OA	9	mo	13	12.8	6	5.4	332.28	265.01
VD	2	mo	12	12.6	7	7.3	417.48	476.73
SY	11	yrs	15	14.6	6	5.5	384.40	313.57
MC	10	mo	16	16.1	6	6.2	408.96	439.41
AD	9	mo	18	17.5	6	6.4	460.08	508.93
VT	3.5	yrs	17	16.9	7	6.8	591.43	554.83
MC	6	yrs	10	9.6	6	5.7	255.60	221.45
PA	6	mo	16	15.4	8	7.7	727.04	648.28
KL	11	yrs	18	17.6	10	9.4	1287.00	1104.15
SP	12	yrs	14	13.6	10	9.5	994.00	871.45
MÖ	9	yrs	19	18.2	12	11.6	1942.56	1738.78
MS	2	yrs	24	23.2	8	7.6	1090.56	951.42
KM	2.5	yrs	16	15.4	8	8.3	727.04	753.24
AK	7	mo	13	12.8	7	6.9	452.27	432.68
AA	2	yrs	13	13.6	7	7.3	452.27	514.57
FA	2	yrs	12	12.3	7	7.4	417.48	478.22
AT	6	yrs	13	13.4	6	6.8	332.28	439.93
			$\bar{X}$: 0.024		$\bar{X}$: 0.152		$\bar{X}$: 7.348	
			SD : 0.574		SD : 0.445		SD : 123.964	
			t : 0.2090		t : 1.707		t : 0.296	
			p > 0.05		p > 0.05		p > 0.05	

Discussion

Several orchidometers have been used to determine testicular volume. The Prader orchidometer is the one most used, however, Prader⁶, noted that in its practical use there was considerable variation in the values obtained because of the

method and the investigator. The Schonfeld's orchidometer is also used widely^{7,8}. However, there are reports indicating that this instrument tends to overestimate the actual size of the small testis, while it underestimates large testicular volumes. Another such instrument is the Tachiara orchidometer⁹, which consists of a graded series of punched out elliptical rings. The testes with its attachments and scrotal skin are evaluated together and are associated with considerable variability. Ultrasonography which is readily available, is a suitable, non-invasive method and gives accurate data concerning dimensions of organs. This method can also be used during the follow-up of patients when evaluating the effect of therapy on testicular integrity. In addition it gives valuable information regarding the changes in the testes and orchidopexies. Ultrasonography can be considered to be a suitable method for quantitative determination of testicular volume.

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