CONGENITAL VARICOCELE IN PRIMARY SCHOOL CHILDREN *(FIELD SURVEY AND THERAPEUTIC OPTIONS)*

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ABSTRACT

Aim: **To determine the incidence of congenital varicocele in pediatric and prepubertal age groups, and to compare between two surgical approaches with different procedures.**

Methods: **In march and April 2001 seven thousands five hundred and forty three pupils in twelve primary schools were examined for detection of congenital varicocele, the pupils were divided into two groups according to age; group one between age of 6-12 years, group two between age of 13-16 years. The positive cases in the two groups were classified into two batches: symptomatic and non-symptomatic; the silent cases were scheduled for expectant management. The symptomatic cases were randomly divided into two groups for surgical options by open varicocelectomy, the first one through inguinal approach with high ligation of spermatic vein, the second through retroperitoneal route with ligation of both spermatic artery and vein.**

Results: **The number of cases of positive varicocele was 16(0.4%) in pediatric age (6-12 years). This figure increased to 102 (2.58%) in prepubertal age (13-16 years). In the positive cases, we found an increase in number with age especially after age of eight. The symptomatic cases were registered only in prepubertal age and varicocele established clinically as age advanced and all positive cases in pediatric age group were silent. The rate of cure in cases treated by venoarterial ligation was 29 cases (90.5%), while it was 23 cases (74%) in those managed by ligation of vein only. The recurrence rate after venoarterial ligation was one case (3%) and after vein ligation only was 3 cases (9.6%). No reduction in size of testes in the batch treated by venoarterial ligation. The incidence of Hydrocele in the cases treated by vein ligation was slightly less than that after venoarterial ligation. The improvement in size of testes is better after venoarterial ligation but the numbers of reduction in the size of varicocele were more in cases treated by vein ligation only. Scrotal hematomas were recorded only after vein ligation. Hospital stay was shorter in cases treated by venoarterial ligation through retroperitoneal route. Wound infection occurred more after vein ligation.**

Conclusion: **In this study we concluded that it is preferable to leave children with silent varicocele for expectant management. The option of spermatic venoarterial ligation for management of varicocele is safe and more rewarding regarding rate of cure and testes volume improvement.**

INTRODUCTION

Varicocele is an abnormal dilatation, tourtuosity and elongation of testicular vein in the pampiniform venous plexus caused by venous reflux. The plexus leaves the posterior border of the testis to ascend upward within the spermatic cord, at the deep inguinal ring it becomes single vein. In the left side the testicular vein joins the left renal vein few centimeters higher than the point of junction between right testicular vein and inferior vena cava.[1] Varicocele is of two types congenital and acquired, the former one nearly always affecting the left testis (86%) and exerting potential fertility problem. However bilateralism of the congenital type is also recorded in other studies, but right sided alone is extremely rare.[2] Varicocele is classified into three grades; grade one Valsalva positive, grade two palpable without Valsalva and grade three visible. It is unusual in boys under 10 years of age and becomes more frequent at the beginning of puberty. It is found in 15-20% of adolescents and adulthood.[2] The hypothesis about the etiology of the primary varicocele has been debated between compressions of left testicular vein by loaded sigmoid, spermatic vein angulations near entry to the left renal vein, spermatic vein spasm by adrenaline metabolites in the venous blood, valve incompetence, intrasecrotal hyperthermia and hypoxia.[2] The clinical evidence of testicular atrophy and histological changes was encountered in over 50% of homolateral and sometime contralateral testes. This effect calls for surgical therapy. The diagnosis and surgical remedy of this disorder is guided by clinical background and color Doppler ultrasound for determination of size of varicocele, pattern of venous flow, testicular volume, resistance index and testicular artery identification.[3]

The aim of this study is to determine the incidence of congenital varicocele in pediatric and prepubertal age groups, and to compare between two surgical approaches.

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PATIENTS AND METHODS

Between March and April 2001, seven thousands five hundred and forty three pupils in the twelve primary schools in Sirte city (Libya) were examined clinically in their schools by consultant and a senior house officer for detection of congenital varicocele; the pupils were divided into two groups:

Group one: morning shift children between ages of 6-12 years (three thousand five hundred ninety one pupils), group two afternoon shift prepupertal between ages of 13-16 year (three thousand nine hundred fifty two pupils), the incidence of positive results were different in the two. The positive cases in the two groups were classified into two categories; the symptomatic and those without symptoms. The silent cases were left for expectant management while the symptomatic cases (pain, small size testes) were randomly divided into two for therapeutic options by open varicocelectomy, batch one were treated by inguinal approach with high ligation of spermatic vein, and batch two treated through retroperitoneal route with ligation of both spermatic artery and vein (Table-6).

RESULTS

The number of positive varicocele cases was 16(0.4%) in the morning shift, this figure rose into one hundred and two (2.58%) in the afternoon shift (Tables 1, 2).

Table 1. Positive cases of varicocele in pupils age 6-12 years.

School	Number of pupils examined	Positive cases
1	228	Nil
2	350	Nil
3	191	1
4	288	Nil
5	291	2
6	574	Nil
7	402	4
8	103	1
9	40	Nil
10	333	Nil
11	561	Nil
12	140	8
Total	**3591**	**16(0.4%)**

Table 2. Positive cases of varicocele in pupils age 13-16 years.

School	Number of pupils examined	Positive cases
1	506	15
2	522	6
3	229	7
4	309	12
5	298	11
6	285	5
7	340	2
8	150	9
9	40	6
10	486	9
11	562	4
12	107	16
Total 12	**3952**	**102 (2.58%)**

In the positive cases according to individual age, we noticed an increase in the number with age in group one (morning shift) and a sharp increase in incidence after the age of eight in group two (13-16 years) (Tables 3, 4).

Table 3. Positive cases of varicocele according to individual age (cases increased with age).

Age	Positive Cases
6	1
7	1
8	1
9	2
10	4
11	4
12	3
Total	**16**

Table 4. Sharp increase in the incidence of varicocele after age of 12.

Age	Positive cases
13	11
14	18
15	27
16	46
Total	**102**

The symptomatic cases *(pain and small size testes)* registered only in group two when the varicocele established clinically as age advanced, (sixty three out of hundred and two 62%). All the sixteen positive cases in group one were silent (Table-5).

Table 5. Clinical Presentation of symptomatic varicocele cases.

Groups	Number Of Cases	Approach	Procedure
A	31(49.206%)	Inguinal	High ligation of spermatic vein
B	32(50.793%)	Retroperitoneal	Spermatic veno-arterial ligation
Total	**63**		

The outcome after surgery and during the follow up (clinically and by Doppler ultrasound) of the two batches subjected to open varicocelectomy is shown in (Table-7 and 8). If we compare the two surgical options we can see the rate of cure in cases treated by venoarterial ligation was 90.5%(29 cases), while it is 74%(23case) in cases managed by ligation of vein only. The recurrence rate (in two-year follow up) was also less in patients treated with venoarterial ligation 3%(1 case), while it was 9.6%(3 cases) in those treated by vein ligation only. No reduction in size of testes was seen in the batch treated by venoarterial ligation. The incidence of hydrocele which is a troublesome morbidity after varicocelectomy was 9%(3 cases) after venoarterial ligation and 6.4%(2 cases) after vein ligation only, the improvement in size of testes was 84% (27cases) after venoarterial ligation and 68%(21cases) after vein ligation. Varicocele to some extent decreased in size in 9%(3 cases) in venoarterial ligation and 26%(8cases) in vein ligation. Scrotal hematomas 9%(3cases) were recorded only after vein ligation through inguinal approach. Hospital stay was shorter after venoarterial ligation through retroperitoneal approach (one day versus two after vein ligation). Wounds infection occurred more after vein ligation 6%(2 cases), and only 3%(1case) after venoarterial ligature.

Table 6.Therapeutic surgical procedures used in the management of varicocele cases.

Outcome	No.	%
Varic cele cured	23	74.19
Varicocele decreased	8	25.8
Hydrocele	2	6.45
Recurrence	3	9.677
Testes increased in size	21	67.7
Testes volume decreased	Nil	
Scrotal hematomas	3	9.677
Wound infection	2	6.45

Table 7. Outcome after spermatic vein ligation (A), n =31.

Outcome	No.	%
Varicocele cured	29	90.6
Varicocele decreased	3	9.37
Hydrocele	3	9.37
Recurrence	1	3.125
Testes increased in size	27	84.375
Testes volume decreased	Nil	-
Wound infection	1	3.125
Hospital stay	1 Day	-

DISCUSSION

Varicocele in pediatrics and prepubertal age is associated with congenital defects in valves governing the spermatic venous return. It is a primary phenomenon slowly growing, becomes clinically evident in the following years; it develops during accelerated body growth by a mechanism that is not clearly understood.[2] The prevalence of varicocele demonstrates clear regional differences and in this study the incidence in age groups 6-12 years was only 0.4%; this figure raised to 2.58% in age group 13-15 years. Another study carried out in a European society gave different and higher figures more often among dark-eyed boys.[4] In our study boys examined were from local and closed Arab society, most of them have dark eyes but the incidence was much lower. The choice between intervention and expectant treatment depends on criteria of pain as subjective data and reduction in testes volume as an objective one.[5] In the absence of symptoms expectant management is advised. However timing and approach of interventions is controversial; the former relies mainly on symptoms, [6] while the latter varies according to different studies, inguinal, retroperitoneal or percutanous approach, with no enough data supporting the superiority of any.[7-10] Ligation of both spermatic artery and vein through retroperitoneal route gives better result regarding percentage of cure, incidence of recurrence and improvement in volume of testes however the latter may be attributed to testicular edema associated with the division of lymphatic vessels.[2] High incidence of recurrence after vein ligation reflects the extensive venous anastamosis.[11-14] Hydrocele as postoperative morbidity was encountered more after venoarterial ligation.[15] We treated those cases by follow up, multiple puncture aspiration or surgery. There is an increase trend in surgeons to tackle varicocele surgically by venoarterial ligation at any age because of fear from infertility and high rate of cure and low incidence of relapse. [16,17]

In conclusion: in our study the incidence of varicocele was 0.4% in children and 2.58% in adolescents, quite different and lower than that in Europe 4.1% and 7.9%.[4] It is preferable to leave children with silent varicocele for expectant management and there is no enough data supporting early intervention. The choice of varicocelectomy by spermatic venoarterial ligation is more rewarding regarding rate of cure, relapse and testes volume improvement.

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