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Abstract:
Undescended testis is a common problem with high risk of infertility and cancer. Early surgical correction is important for prevention of those risks. In the last year 1999, multi-disciplinary projects were done between surgical, dermatological and pediatric departments aiming to re-explore the histological and morphological changes in cryptorchid testis and its relation to age.

Twenty four (24) male patients were recruited from El-Minia University Hospital and were divided into 4 main groups. Group A included 6 infants under the age of 2 years; group B included 4 patients aged from 2-9 years (pre-pubertal); group C included 6 patients aged from 9 to 14 years (pubertal); and group D included 8 patients aged from 14 to 21 years (post-pubertal). Orchiopexy was done for all patients in one stage and bilateral testicular biopsy was taken and fixed immediately in Bau’s solution and then stained by H & E for histopathological preparations. Our results showed that, for boys under the age of 2 years, there was no change from the normal spermatogonia and Sertoli cells with no thickening of their basement membrane. In pre-pubertal children, we found that changes were evident by the age of 7 and 8 years in the form of decreased number of spermatogonia, delayed maturation of Sertoli cells, widening of interstitial spaces and increased number of fibroblasts in the interstitium. In pubertal patients, the spermatogonia became rare and Sertoli cells were immature. Biopsy specimens from post-pubertal patients showed marked reduction of spermatogonia and arrest of spermatogenesis at primary spermatocyte stage. We concluded that early correction of cryptorchidism is vital for preservation of testicular integrity and maintenance of fertility.

Introduction:
Cryptorchid testes are frequently accompanied by gross morphological changes with regard to the size and shape of the testis, various degrees of detachment between the epididymis and testis elongation of the caudal epididymis and vas, as well as histological changes.¹ The association between cryptorchidism and infertility, testicular cancer, inguinal hernia, testicular atrophy is well known fact.²

The necessity for early surgical correction of cryptorchidism is established. These patients, at least in our locality, still tend to come very late with consequent increased risks of infertility and malignant transformation.

In this study, we aimed to identify the histological changes in cryptorchid testes in relation to age and to rate them in score pattern. Another goal was to try to answer the question: "Does the unilateral maldescended testis affect the normal contra lateral testis with consequent histological finding?"

Subjects and Methods:
The study included 24 male patients referred from Pediatric and Andrology departments to the units of surgery at El-Minia University Hospital, in the year 1999. Each patient was subjected to full history and clinical examination. Abdominal ultrasonography was advocated to all patients with palpable or impalpable testis. CT scan was done only for 4 patients with impalpable testis not visualized by ultrasonography.

<table>
<thead>
<tr>
<th>Clinical presentation</th>
<th>No of patients</th>
</tr>
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<tbody>
<tr>
<td>- Parents observation of empty scrotum</td>
<td>10</td>
</tr>
<tr>
<td>- Infertility</td>
<td>8</td>
</tr>
<tr>
<td>- Incidental</td>
<td>6</td>
</tr>
<tr>
<td>- Clinical palpable testis</td>
<td>18</td>
</tr>
<tr>
<td>- Sonographic visualization.</td>
<td>20</td>
</tr>
<tr>
<td>- C. T. Visualization</td>
<td>4</td>
</tr>
<tr>
<td>- Bilateral undescended.</td>
<td>10</td>
</tr>
<tr>
<td>- Infalateral</td>
<td>14</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Anatomical site</th>
<th>No of patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>- In the inguinal canal</td>
<td>17</td>
</tr>
<tr>
<td>- Supra-scrotal</td>
<td>3</td>
</tr>
<tr>
<td>- Intra-abdominal</td>
<td>4</td>
</tr>
</tbody>
</table>

Our subjects had an age range varying between 16 months and 21 years (mean 13 years). All of them, but 4, had palpable testes. Those four patients had intra-abdominal testis detected only by CT.

The studied patients were classified into 4 groups. Group A (infantile, below the age of 2 years)
included 6 children. Group B (pre-pubertal, from 2 to < 9 years) included 4 children. Pubertal group (group C, from 9 to < 14 years) and group D (post-pubertal, from 14 to 21 years) included 6 and 8 patients respectively.

Operative data:
- General endotracheal anesthesia or regional spinal analgesia.
- Inguinal incision was made and the canal was opened by division of the external oblique aponeurosis upwards from the superficial ring. If a hernial sac was present, it was isolated and cut across above the testis, dissected up as far as the deep ring and transfixed.
- The spermatic vessels were gently teared apart and any fascial bands that are responsible for shortening were divided. After this it was possible to bring the testis down.
- Testicular biopsy was taken from both testis and the tunica albuginia was then sutured (4/0 vicryl).
- Orchidopexy in a sub-dartos pouch was achieved.

Histological preparation:
Forty (40) testicular biopsies were obtained from 24 patients aged between 16 months and 21 years. The biopsy specimen was immediately fixed in Bouin's solution. Paraffin sections were stained by hematoxylin and eosin and by Periodic Acid Schiff. Sections were examined under light microscope and scored according to Johnson (1970). At least 50 cross-sectioned tubules were counted, but this was not always possible if the specimen was too small.

Results:
Of the 40 testicular biopsies studied, 28 (70%) were unilateral and 12 (30%) were bilateral. Biopsy specimen from boys under the age of 2 years showed no change from the normal spermatogonia and Sertoli cells with no thickening of their basement membrane. The interstitium showed normal Leydig cell precursors. Changes started to appear in pre-pubertal children with decreased number of spermatogonia, delayed maturation of Sertoli cells, widening of interstitial spaces and increased number of fibroblasts in the interstitial tissue. The aforementioned changes were evident by the age of 7 and 8 years. In pubertal patients the spermatogonia became rare and Sertoli cells were immature. Biopsy specimens from post-pubertal patients showed marked reduction of spermatogonia and arrest of spermatogenesis at the primary spermatocyte stage. Some patients showed complete absence of spermatogonia. Stained sections showed normal mild or moderate thickening of basement membrane. An interesting observation has been reported in a 21 years old patient. The undescended testis showed partly delayed maturation of seminiferous tubules and partial arrest of spermatogenesis at the primary spermatocyte stage. The contra lateral normally descended testis showed full spermatogenesis with many sperms in the majority of tubules.

Discussion:
The principal problem of treatment for cryptorchidism is to obtain normal spermatogenesis. If left untreated, patients with bilateral undescended testes almost certainly will be infertile. Moreover, only 62% of patients with unilateral undescended testis are fertile, even if orchidopexy had been done before puberty. It is evident that the fertility prognosis of cryptorchidism is related to the timing of surgical interference. However, the optimal time for an operation is controversial. Some recommended performing the operation when the patient is 2 years old. Others suggest that it should be delayed until the patient is 10 years old. At the histological level, we observed that the morphological changes in both the seminiferous tubules and interstitium started after the age of 2 years. There was a progressive reduction in number of germ cells, non maturation of Sertoli cells, widening of interstitial space and increased fibroblasts in the interstitial tissue. These findings concord with those of Gaudio et al., who studied biopsies obtained from 15 patients aged between 2 and 39 years. In post-pubertal patients, we found marked reduction, up to complete absence of spermatogonia, arrest of spermatogenesis and mild to moderate thickening of the basement membrane. The normally descended contra lateral testis showed, in some patients, similar changes to the cryptorchid one. These observations are consistent with those reported by Mancini et al.,7 who found that the cryptorchid testis showed arrest of development of the germinal epithelium and Sertoli cells starting in early infancy and was maximum in the adults. The impact of timing of orchiopexy upon the testicular growth was emphasized in the study carried out by Lanna et al. They took a biopsy at the time of orchiopexy from 45 patients aged from 4
to 14 years and again from the same testis 4 to 89 months later. They stated that when an orchiopexy was done before the age of 7 years, the testis developed normally and the histological changes usually found in untreated undescended testis did not occur. Moreover, when orchiopexy was done after the age of 7 years, histological changes which had already occurred persisted.8

**Conclusion:**

Most normal findings were observed in children less than 2 years old. By time, there was a progressive damage of the tubules epithelium. Therefore, we recommend that the surgical intervention should be undertaken before the child reaches his second birthday.

**References:**