Abstract: The technique described by Shehata for lengthening of testicular vessels was used in the management of intra-abdominal testes in nine children. Three had bilateral undescended testes. Both stages of the surgery have been completed in eight, while the ninth is due for the second stage. One of these children had to have a redo of traction application before orchidopexy could be done. Another child developed adhesions to the colon that made second stage surgery difficult. There was no testicular loss. The Shehata technique keeps the option to retain the native blood supply in instances where there is concern with the Fowler Stephen technique.

Laparoscopic traction technique (Shehata technique)

Introduction: Currently, the surgeon performing laparoscopy for intra-abdominal testis has to choose between removal of a dysplastic testis, single stage orchidopexy and division of testicular vessels in the first stage of a Fowler Stephen orchidopexy(1,2). The judgment between the latter two is difficult as loss of blood supply irrevocable. Older children with bilateral intra-abdominal testes present an added problem due to the distances that need to be covered in the second stage.

Results. These nine children presented with a history of absence of testis in the scrotum from birth. Three children already had an ultrasound done locating the testis at the deep inguinal ring and intra-operatively they were found to be in the abdomen. One child with bilateral IAT and hypospadias had been evaluated for disorder of sexual development (DSD) and showed normal hormone levels consistent with his male karyotype. Eight of the nine have completed both stages of the operations. And the ninth is due for his second stage procedure. The average waiting period before performing the second stage was 12 weeks (range 3 weeks to 24 weeks). The age at first surgery ranged from 2 to 13 years (average 8yr). In the three boys with bilateral undescended testis, two had bilateral Shehata’s orchidopexy done. In one child, Shehata’s was done on the right side but Fowler-Stephens orchidopexy was done on the left due to a fibrous spleno-gonadal fusion with no separate gonadal vessel. Of the six boys with unilateral IAT, Shehata’s orchidopexy was done, four who had it on the right side. Of the remaining two with left sided IATs, one has completed both stages and in the other child’s second stage is due. Two testis which were remarked to have been half the size of opposite testis before orchidopexy.
One child had long loop Vas, which travelled into inguinal canal and then came back to rejoin the testis. In one child the traction suture had given way and a redo first stage was done with the second stage done after 3 weeks. Follow up:

Out of nine children three have follow up of 2 year following surgery. There was no retraction or decrease in volume of testis.

Discussion

Before the widespread adoption of laparoscopy and laparoscopic Fowler Stephens procedure, open staged orchiopepxy involved fixing the testis under traction without dividing the testicular vessels; to be mobilized in a second stage. (2,4) In 1997 John Foker published his elegant study on traction induced growth of tissue and later his technique of esophageal lengthening for long gap esophageal atresia. Sameh Shehata from Alexandria in 2008 published his adoption of the Foker principle in the laparoscopy assisted traction lengthening of testicular vessels for orchiopepxy in intra-abdominal testes(3). While his initial results were published and Shehata has communicated the variation that he has made to his own technique, there have been no further published results on outcome. Shehata proposes that the weight of intestines over the pedicle leads to gradual increase in length without spasm, intimal tear or occlusion of spermatic vessels(3)

Traction histogenesis is used in orthopedics for limb lengthening. In 1909 Torek utilized the same principle for fixing the IAT to fascia lata to gain length for the second stage orchiopepxy. In 1931 Cavot and Nesbitt used wire cage and rubber band for external traction on testis for 12 days followed by fixing the testis into the sub-dartos pouch,(2)Shehata studied the effect of traction on the vascularity of testis by Doppler studies in 2008. The original method elucidated by Shehata is to transfix the testis with prolene suture and the suture ends brought and tied over outside the abdominal wall.. The traction was gradually increased by inserting plastic tubes onto the external placed loop of prolene over 14 days. The vascularity was confirmed by a Doppler study. Re-laparoscopy was done after 14 days, the length gained was measured and second stage surgery completed by bringing the testis medial to deep inguinal ring (Prentiss manuvoure) to fix the testis in the scrotum.(3) Shehata later modified the technique by fixing the testis internally to the abdominal wall near opposite ASIS and did the second stage surgery after 12 weeks. There has always been concern on the implications of testicular vessel division in spite of the experimental studies done by Fowler and Stephen. Rosito in 2004 presented a prospective case study designed to evaluate the viability and compare the histology and volume of intra-abdominal testes before and after ligature of the spermatic vessels. Ligation of the spermatic vessels during the first stage of orchiopepxy for intraabdominal testicles was associated with a significant reduction of spermatogonia without significant changes in the volumetric characteristics of the testicles(5). In experimental studies, ligation of the spermatic vessels generated controversial results, depending on the animal model(2). In Sprague-Dawley rats, clipping of the spermatic vessels reduced testicular blood flow by 80% at 1 h but it was restored to normal at 30 days without any loss of testicular integrity.(5) Further experimental studies are necessary to evaluate the repercussions on future fertility.(2)

Conclusion.

Having been without a safe alternative, Shehata’s technique of staged orchiopepxy for intra abdominal testis appears to address the fear of jeopardizing the native vascularity. While this study was limited by its small size and short follow up, the results have encouraged us to offer the technique in instances where there is concern with the Fowler Stephen technique viz. the single viable abdominal testis, the bilateral undescended testis in prune belly syndrome and the older child with long distances to cover. Having demonstrated immediate comparable outcome, further long term studies should compare vascularity and fertility between the staged Shehata and Fowler Stephen techniques.(2)

Bibliography


