MODIFIED ONE STAGE MUSTARDEE HYPOSPADIAS REPAIR: A REVIEW OF 55 PATIENTS

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ABSTRACT

Background and objectives Hypospadias is a common congenital anomaly. Many methods for repair of hypospadias have been emerged; all have the same objective. Recently several surgeons recommended one-stage hypospadias repair. The objective of the study was to determine the operative time and outcome of hypospadias repair by one stage tabularized ventral penile skin flap urethroplasty.

Methods This study was a review of 55 patients who had been diagnosed with hypospadias. The study was conducted at Azadi General Teaching Hospital in Duhok governorate, Kurdistan region, Iraq between June 2006 and February 2007. This is the main referral hospital in Duhok where patients with urologic problems receive medical care. All patients underwent a one stage hypospadias repair using premeatal based tube flap repair (a modified Mustardee operation).

Results A total of 55 patients included in the study with a median age of patient of 4 years (range 9 months – 30 years). The operative time was 60 minutes with a range of 50-70 minutes. Complications were occurred in about half of the patients but most subsided with further conservative or surgical intervention. Fistula formation was the commonest one (21.8%) followed by meatal stenosis (12.8).

Conclusions Final outcome following modified Mustardee operation is comparable to the other techniques and surgeons can be encouraged to perform such technique.

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Key words: Hypospadias, One stage repair, Urethroplasty, Duhok

Hypospadias is a congenital abnormality of the penis which results in an incomplete development of the anterior urethra. It is characterized by malpositioning of the opening of the urinary meatus on the ventral aspect of the penis proximal to the tip of the glans penis. The urethral opening may be anywhere along the shaft of the penis, within the scrotum or even in the perineum. Chordee, which is ventral shortening and curvature, is often associated and usually with more proximal urethral defects.[1-3]

The prevalence of hypospadias varies widely across different population and is estimated to be between 1 in 300 and 1 in 250 male births.[4,5] Rate of hypospadias had doubled between 1970s and 1990s in the United States and several European countries.[6,7]

It is recognized that the etiology of hypospadias is multifactorial comprising hereditary, genetic, endocrinal and environmental.[1,8,9]

Hypospadias is classified based on the location of abnormal urethral meatus. Although several different classifications have been suggested; however, many physicians have adopted the classification that was proposed by Barcat.

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This classification is based on the location of the meatus after correction of associated chordee.[3] This classification includes three principle types: anterior (glandular, coronal or distal), middle, and posterior (posterior penile, penoscrotal, scrotal, or perineal).[1,10]

The field of hypospadias remains full of challenges in the search for the new and better solutions. Many types of surgical procedures have developed all of which have principle objectives, with optimum results and less complications, of improving the functional aspects of penis, permitting urination standing up.[3] So surgery is technically demanding but the results may be less than satisfactory.[11] Complications includes fistula formation, meatal stenosis, stricture and disruption.[3,12] Cosmetic outcome is important specially nowadays in some centers.[13]

The objectives of this study were to determine the operative time and outcome of hypospadias repair by one stage tabularized ventral penile skin flap urethroplasty.

METHODS

This study was a review of 55 patients who had hypospadias. The study was conducted at Azadi General Teaching Hospital in Duhok governorate, Kurdistan region, Iraq between June 2006 and February 2007. This hospital is the main referral hospital for urology patients in Duhok. All patients who had hypospadias and referred to the hospital during the study period were enrolled in the study. The inclusion criteria were patient who had penile hypospadias regardless of the age and who had no or one previous surgical repair of hypospadias. A written consent was obtained from patients' parents to undergo the operation for their children. All patients were managed by the same surgical team, including the authors.

Technique

All patients underwent a one stage hypospadias repair using premeatal based tube flap repair (a modified Mustardee operation). The operation was done under general anesthesia. No tourniquet was used during the surgery.

All adhesions between glans and prepuce were removed. Meatal dilatation was done for all cases using artery-forceps with use of lidocaine gel.

Pre-meatal ventral penile skin was marked for distance equal to the distance between the meatal opening and the tip of the penis (Figure 1). Then, the skin flap was released upward till the meatal opening (Figure 2).

Figure1. Marking and incision of pre-meatal penile skin

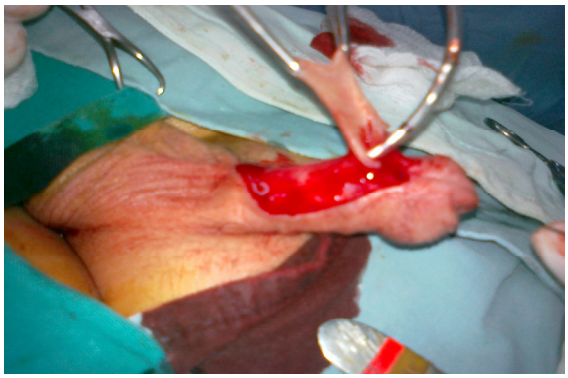

Figure 2. Releasing of the skin flap

Small horizontal incision of 1-2 cm was made in the ventral part of the skin just distal to the meatal opening and all the fibrous tissues were excised from the corpora to correct chordee. Vertical incision was done from the meatal opening to the tip of glans, bisecting the glans into two wings.

A stent was put to divert urine. For children, nasogastric (NG) tube 8 Fr was used as a catheter while in adults, Foleys catheter 12 Fr was used.

A tube was made from the skin flap around the NG tube and stitched intermittently using 6/0 PDS suture with the suture line located posteriorly (Figure 3).

Figure 3. Tube formation from the skin flap around the nasogastric tube

The end of the tube was sutured to tip of the glans using 6/0 PDS sutures. Anastomosis of both wings of the bisected glans were performed anterior to the urethral tube with 2-3 interrupted stitches using 5-6/0 PDS sutures (Figure 4).

Figure 4. Suturing of the wings around the tube

For uncircumcised patients, the prepusal skin was released from the dorsum of the penis completely, divided in the middle, and then both parts of the prepuce were brought anteriorly and sutured ventrally to cover the raw area using 6/0 PDS sutures (Figure 5). For circumcised patients, the raw area was covered by rotational skin flap from the base of penis or sides of scrotum.

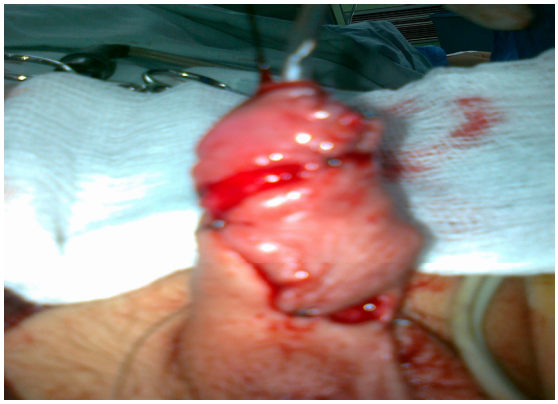

Figure 5. Release of prepusal skin and anterior suturing

Hemostasis was done by direct pressure and bipolar cautery.

NG tube was fixed to the tip of the glans using 3/0 silk stay suture. The tube was connected to a closed drainage system, and fixed by plaster to the abdomen (Figure 6).

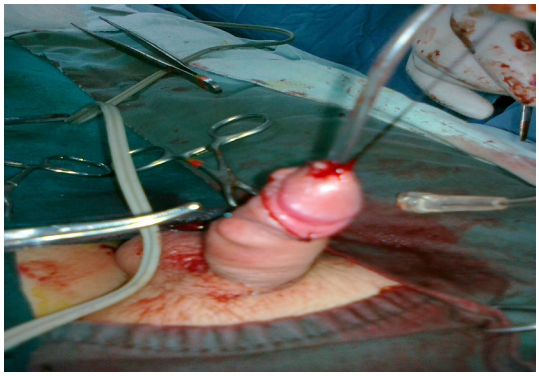

Figure 6. The end results of Mustardee technique

Loose dressing was done using sofratol and gauze plaster. Dressing was changed on the 5th postoperative day and thereafter on every other day.

All patients were given antibiotics prophylactic (cefotaxime). Antispasmodics and analgesics were used and high fluid intake was encouraged to avoid blockage

of the catheter. Sometimes, irrigation through the catheter was done to avoid any blockage. Adults patients were given estrogen to avoid erection.

All patients were kept in the hospital for 10 days. Catheter was left in for 10 days. Patients were discharged on 11th post operative day after urine per urethra was passed and urine stream was observed. Patients were followed up during admission, at 2 weeks, at 1month and at 3 months.

RESULTS

Fifty-five patients with hypospadias presented to the Urology department in Azadi General Teaching Hospital during the study period were included in the study and operated on. All patients were followed up for a minimum of 3 months and for 6 months in most patients. The time required to perform the operation was 50-70 minutes with a median of 60 minutes.

Patients ranged in age from 9 months to 30 years (median 4 years). Forty-two patients (76.4%) were brought by their parents and 13 cases (23.6%) were referred by either pediatrician or by self-seeking.

Forty-seven patients (85.5%) had chordee at the time of operation with different degrees of severity. Only 19 patients (34.5%) were circumcised at the time presentation. History of previous hypospadias repair was encountered in 13 patients (23.6%).

Table 1 shows distribution of patients according to the types of hypospadias. Around half of the patients had middle followed by distal penile hypospadias, 28 patients (50.9%) and 21 patients (38.2%), respectively.

Table 1. Distribution of patients according to the types of hypospadias (N = 55)

Type	No. (%)
Distal penile	21 (38.2)
Middle penile	28 (50.9)
Proximal penile	5 (8.9)
Peno-scrotal	1 (1.8)

Thirty-two patients (58.2%) developed no complication at all during their whole follow up period while one or more complications, whether minor or major, were encountered in the rest. Major complications, one or more, were encountered in 21 patients (38.2%). Table 2 illustrates complications developed by patients at different postoperative times. Fistula was seen in 12 patients (21.8%). In 4 patients, fistula was repaired by surgery and in other 2 patients, surgery was planned for. In three patients, catheter placed in again and the fistula healed later on. Fistula in the rest healed spontaneously after patients treated for other associated complications. Meatal stenosis was noticed in 10 patients (18.2%) in whom subsequent regular meatal dilatation was performed. Chordee seen in one patient for whom further surgical intervention was planned to correct for the chordee. Reccurence of the hypospadias was observed in only one case during the follow up period.

Table 2. Complications developed by patients at different postoperative times

Complication	No. (%)
Minor complications	
Wound infections	9 (16.4)
Obstructed catheter	2 (3.6)
Major complications	
Fistula	12 (21.8)
Meatal Stenosis	10 (18.2)
Chordee	1 (1.8)
Disruption (recurrence)	1 (1.8)

DISCUSSION

Hypospadias is a common clinical problem.[10] Many methods of operations have been introduced to repair hypospadias. The goal of repair is functionally and cosmetically normal penis. Many surgeons prefers two-stage procedure[14] while other recommends one-stage procedures.[15-17] This implies that there is no standard technique.

Authors of this study adopted a

modification of Mustardee method of repairing hypospadias, which depend on the construction of new urethra from the premeatal skin. In additions, the authors separated the glans by vertical incision in the glanular groove forming two wings to cover the tabularized-urethra in 2 layers.

Around half of patients developed complications. The reported incidence of complications range from 6 to 30%, varying with the severity of the hypospadias.[18,19] This noted discrepancy between this study and the reported incidence in the literature might be because several factors are included in the development of complications, for example age. The median age of patients at operation in this study was 4 years while the optimum age for correcting hypospadias infancy.[20,21]

The rate of fistula was 21.8% which is comparable with that from other techniques (0-23%).[22,23] Careful preservation of vasculature of the flap and avoidance of overlapping suture lines produce a watertight closure with minimum risk of post-operative fistula formation.

The cause of chordee is tethering of hypoplastic/aplastic corpus spongiosum tissue or urethral plate with the underlying corpora. Mobilizing urethra relieves chordee in most of instances and no further procedure is required for correction of chordee.

No tourniquet was used in this method. This allowed hemostasis during operation and therefore reduced post-operative edema and hematoma . Bipolar cautery for meticulous hemostasis, direct pressure intraoperativly and loose dressing was used. Use of non-compressive dressing reduces post-operative pain and change of dressing is less uncomfortable. Authors did not attempt to measure pain objectively, but none of patients in this study needs sedation to change the first dressing. Compressing dressing is liked and used by many surgeons. but this study found that loose dressing, if there is good hemostasis, has better out come.

Hypospadias is a common disease. Patients present at different ages for repair, seeks different opinion of different surgeons for repair. Lack of preputial skin, by circumcision due to religious rules, made the repair sometimes difficult. Fistula rate among patients with hypospadias is acceptable with observance of a high percentage of fistula-repair. Final outcome was very good with s high success rate after about 3-6 months of regular follow up. In patients with previous surgery or lack of skin (circumcision), the cosmetic appearance was not as good as in patients not exposed to previous surgery or circumcision; regarding urethroplasty, the result was very good.

Modified Mustardee operation is advised for cases of proximal and middle penile hypospadias with no or mild chordee and better if they have no previous attempt for repair of uncircumcised patients. It is better to follow patients for a duration longer than 3-6 months before deciding the final outcome.

Parents are advised not to circumcise their children when there is ambiguous genitalia.

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پوختە

نشتەرگەریا جیگرنا میزتنا ژ بنفەب ریکا ماستاردی یا معەدەل ب ئیک جارێدیتنا 56 نەخوشا

پێشەکی و ئارمانج: پێشەکی:میزتنا ژبنڤە ئێکە ژ نەدروستیێن زکماکی یێن مشەو گەلەک ڕێک یێن هاتینە دیارکرن بو چێکرنا ڤێ نەدروستیێ. گەلەک نشتەرکار ل ڤێ دوماهیێ هاندانا ڕێکا ئێک قوناغ دکەن بو چێکرنا نەدروستیا میزتنا ژبنڤە. ئارمانج ژ ڤەکولینێ دەستنیشانکرنا دەمێ پێدڤی و ئەنجامێن داویێ یێن نشتەرگەریا ئێک قوناغ بو چێکرنێ (one stage tabularized ventral penile skin flap urethroplasty).

ریکێن ڤەکولینێ: ئەڤ ڤەکولینە پێداچونەک بوو لسەر 55 نەخوشێن هاتینە دەستنیشانکرن ب نەدروستیا میزتنا ژبنڤە. ڤەکولین هاتە کرن ل نەخوشخانا ئازادی لپارێزگەها دهوکێ– هەرێما کوردستانێ– عیراق هەر ژ خزیرانا 2006ێ هەتا شواتا 2007ێ. ئەڤ نەخوشخانە یا ئێکانەیە لپارێزگەها دهوکێ بو وەرگرتنا نەخوشێن ئاریشێن جوبارێن میزێ هەی. بو هەمی نەخوشان نشتەرگەریا پێدڤی یا ئێک قوناغ هاتە کرن بڕێکا (premeatal based tube flap repair (a modified Mustardee operation.

ئەنجام: تێکرایێ ژیێ هەر 55 نەخوشان 4 سال بوون (9 هەیڤ – 30 سال) و تێکرایێ دەمێ نشتەرگەریێ 60 خولەک بوون ب ڕێژا 50 – 70 خولەک. ئالوزییێن نشتەرگەریێ بو نێزیکی 50٪ ژنەخوشان دیاربوون بەلێ پرانیا وان هاتنە چارەسەرکرن یان ب چاڤدێری یان ژی ب نشتەرگەری. مشەترین ئالوزی ناسور بوو (21.8٪) و لدویفدا تەنگبوونا بوریکێ (12.8٪).

دەرئەنجام: ئەنجامێ دوماهیکێ پشتی نشتەرگەریا modified Mustardee operation دیاربوو کو وەکی ڕێکێن دی یە و باشە نشتەرکار بهێنە هاندان بو بکارئینانا ڤێ ڕێکێ.

الخلاصة

ترميم المبال التحتاني بطريقة ماستاردي المعدلة بمرحلة واحدة:مراجعة ل 56 حالة

خلفية واهداف البحث: المبال التحتاني هو شذوذ خلقي شائع. وقد ظهرت العديد من الطرق لترميم المبال تحتاني. وقد اوصى عدد من جراحي المسالك البولية مؤخرا طريقة الترميم ذات المرحلة الواحدة. الهدف هو لتحديد الزمن المطلوب والنتيجة النهائية لعملية الترميم ذات المرحلة الواحدة urethroplasy repair by one stage tabularized ventral penile skin flap.

طرق البحث: هذه الدراسة كانت استعراضا ل 55 مريض تم تشخيصهم بالمبال التحتاني. وقد أجريت هذه الدراسة في مستشفى أزادي التعليمي العام في محافظة دهوك، اقليم كردستان العراق في الفترة ما بين يونيو 2006 وفبراير 2007. وتعتبر المستشفى الوحيدة في محافظة دهوك لاستقبال المرضى المصابين بامراض المسالك البولية. و قد تم اجراء العملية اللازمة لجميع المرضى باستخدام premeatal based tube flap repair (a modified Mustardee operation).

النتائج: ما مجموعه 55 مريضا شملتهم الدراسة مع متوسط عمر المريض 4 سنوات (9 شهور -- 30 سنة). كان الزمن المستغرق لاجراء العملية هو 60 دقيقة بمعدل 50–70 دقيقة. وقد حدثت مضاعفات لعدد من المرضي ما يقارب 50% ولكن معظمهم عولجوا أما تحفظيا او بتدخل جراحي. وكان حدوث الناسور الاكثر شيوعا (21.8 ٪)، يليه تضيق الصماخ (12.8%).

الاستنتاجات: النتيجة النهائية بعد عملية modified Mustardee operation مشابه للتقنيات الأخرى، ويمكن تشجيع الجراحين للقيام بهذه التقنية.