CASE PRESENTATION

Muscle Transplant for Faecal Incontinence

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CHILDREN with faecal incontinence are ridiculed by siblings, shunned by school mates and on occassions abndoned by parents. Despite the improvement in the management of children with imperforated anus there is still a handfull of older children who remain incontinent despite repeated operations and various medical regimes.

The result of surgery for high imperforated anus is fairly good but not as good as the low anomalies. About 50% of these children get good result after abdomino-perineal pullthrough. But 25% get fair results and the other 25% are completely incontinent. This depends on the development of the pelvic floor muscles. These muscles are essential for faecal continence in high imperforated anus where the internal sphincter is absent and the external sphincter is poorly developed. The levator ani originate from the sacrum. The absence of the sacrum suggest poorly developed pelvic floor muscles and levator ani.

The "gracilis muscle transplant" offers an opportunity for these patients to become continent. The gracilis muscle originates from the lower half of the pubic symphysis and the upper half of the pubic arch, traverses the thigh medial to the adductor longus, curves around the medial condyle of the tibia and inserts as a flat tendon into the tuberosity of the tibia. The gracilis is a flat muscle which becomes tendinous. Innerviation is derived from L 2, 3, 4 through the obturator nerve. The nerve and the blood supply enter the lateral side just above the mid portion of the muscle belly. Normally, the gracilis muscle adducts, flexe and rotates the thigh inwards.

MATERIALS AND METHODS

A seven years old male presented with complete faecal incontinence. He was born with high imperforated anus and recto-urethral fistula. He had right transverse colostomy which was followed by abdomino-perineal pull through at one year of age. Colostomy was closed one month after the abdomino-perineal pull through. He had no immediate post-operative complications but he remained incontinent.

On the 23rd of June, 1981 he was admitted to he Paediatric Surgical Unit at Salmaniya Medical Center for evaluation. Urine culture showed E. Coli sensitive to Septrin. IVP showed mild degree of right hydronephrosis and dilatation of the right ureter with suspicion of vesico-ureteric obstruction. Micturating cystogram showed normal bladder wall and urethra with no vesico-ureteric reflux. Cystoscopy showed normal bladder mucosa, normal ureteric orifices and the ureteric catheter passed easily through the right ureteric orifice.

The medical management including suppositories, dietary restriction, enemas and drugs that suppress peristalsis, did not improve his incontinence and we felt that gracilis transplant was indicated.

Extensive mechanical intestinal cleansing was started four days prior to the operation. He was given a clear liquid and alimental diets together with laxatives by mouth and rectal irrigation. Neomycin was given 100 mg/kg in 4 divided doses, and metronidazole 7 mg/kg eight hourly.

After the patient was anaesthetised the assistant irrigated the rectum with Providone-iodine and

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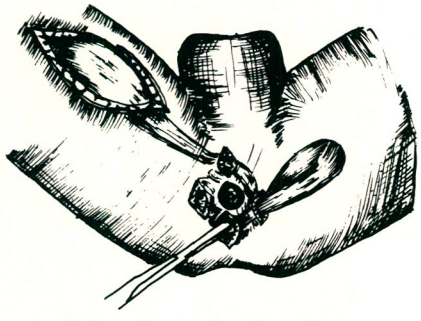
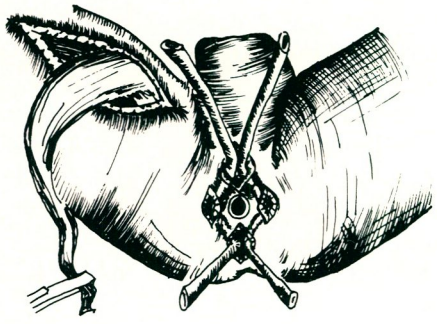
finally swabed the rectal mucosa with a sponge soaked in the same solution. The legs, perineum and the lower abdomen were scrubbed and painted with povidone-iodine. As originally described (5) the muscle was mobilised with the patient supine, the legs were then placed in lithotomy position for the perineal portion of the operation. The initial incision was made in the distal third of the thigh over the tendon of the gracilis (A). The excision was deepend through the skin, subcutaneous tissues and the fascia to enter the muscle compartment. The muscle was isolated at this point and encircled with soft penrose drain. The tendon was then dissected as far distally as possible by applying traction to the tendon and by dividing its loose attachment under direct vision with a long pair of scissors. A second curving incision was made at the medial aspect of the knee. The tendon was dissected both proximally and distally until the flattened tendon was isolated directly on the periosteum of the tibia. The freed end of the gracilis was next brought out through the first incision in the thigh. The muscle was mobilized proximally upto its mid portion with both sharp and blunt dissection (B). A third incision was made directly over the muscle in the upper portion of the thigh. It was possible to free more of the muscle distally through this incision until the muscle with the tendon could be delivered and wrapped in a moist pad. The remaining proximal dissection to free the muscle was done cautiously to avoid injury to the neurovascular bundle. After the neurovascular bundle had been indentified, it was possible to dissect for several centimeteres in order to give more proximal muscle length. It was not necessary to divide any distal nerves and artery in order to gain sufficient length in this case. The next incision was made on the mid line anterior to the anus and was connected by subcutaneous dissection to a small incision posterior to the anus. Penrose drains were drawn through these tunnels to guard the gracilis tendon. When tunnelling about the anal canal was completed a large subcutaneous tract was created between the incision anterior to the anus and the most proximal thigh incision. This was roomy enough to accommodate two fingers so the muscle could slide easily and not be constricted. The forceps was then passed through the anal incision to grasp and pull the gracilis through (C). The tendon was passed about the anus until it emerged from the anterior incision. Another incision was made over the tuberosity of the ischium. This incision was deepend through the muscle fibre

Fig. : Surgical Procedure for Gracilis Transplant

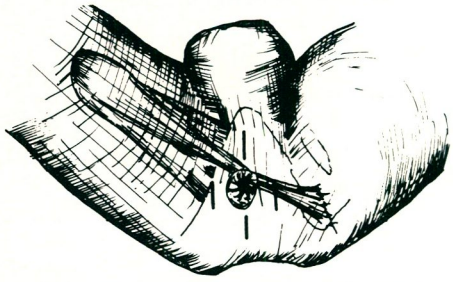
(A) *The child was placed in the lithotomy position with the knee exposed, the entire leg, perineum and rectum are prepared;*



(C) *The tendinous end of the muscle was grasped and brought through a large tunnel in the thigh and then around the anus;*



(B) *The gracilis muscle was isolated through three incisions in the leg, then incisions were made around the rectum to create a tunnel about the anus. These were outlined with penrose drains;*



(D) *The muscle was pulled tightly around the anus and sutured with heavy silk to the periosteum of the ischium.*

until the periosteum of the bone was exposed (D). The end of the gracilis tendon was then led down to this incision where it was sutured to the periosteum of the ischium with heavy non-absorbable sutures. Additional sutures were taken between the tendon and adjacent fascia. The gracilis muscle was pulled so tightly that it was impossible to insert an index finger into the anus. All incisions were closed with subcuticular absorbable sutures and compression dressing was applied to the side.

Post-operatively the child was given a low residual diet and Lomotil to prevent bowel movement for several days. On the sixth day he complained of full feeling in his lower abdomen. He was placed on the toilet, with his legs abducted, a position which relaxes the gracilis muscle. Then he strained and had a bowel movement. The child was continually encouraged to adduct his thighs to tighten the muscles with the help of the physiotherapists.

RESULTS

Our patients had no complication and uneventful post-operative recovery. On the tenth day, with the help of the physiotherapist, we encouraged him to tighten his gracilis muscles by adducting the leg. The first few weeks he had some degree of soiling but by the sixth week he was fully continent except for occasional soiling at night which we did expect because of the voluntary function of the gracilis muscles.

DISCUSSION

Pickrell (1, 2, 3, 4) and his associate, in a series of articles between 1952 and 1959 described the technique for gracilis muscle transplant. They operated on 50 children from 3 - 14 years of age. Most suffered from neurogenic incontinence. All, either achieved complete faecal control or were improved. Pickrell also used the gracilis (5, 6) muscle transplant to correct urinary incontinence in 6 boys. Others have also reported good results for this procedure. Recently, Bradensky (7) reported improvement in 21 out of 24 patient who had the gracilis transplant. All of these authors have used the original techinque described by Pickrell. Hartal (8) however, has modified the operation by using the proximal portion of both gracilis muscles which are warpped around the anal canal and sutured to one another. Ref. No. (9), presented his experience during 20 years with seven children with complete incontinence. Three had good results, another three improved but one was a complete failure after post-operative infection.

We believe that gracilis muscle transplant is a last resort for children who have been unable to develop continence after re-exploration of the levator sling and who have failed to respond to medical management including suppositories, dietry restriction, enemas and drugs that suppress peristalsis. A long period of bowel cleansing is necessary prior to operation to avoid infection. The most important technical detail is to make the transplanted muscle as snug as possible around the anal canal. Continued post-operative training and supervision is necessary for a successful result.

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