TREATMENT OF ADDUCTOR PARALYSIS BY HAMSTRING TRANSPOSITION

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Isolated loss of power of the adductor muscles of the thigh can occur as a result of poliomyelitis, but it is much more likely to develop as a complication of an over-enthusiastic adductor tenotomy in the spastic. In an attempt to correct the adduction of the thighs with its attendant severe scissor gait, obturator neurectomy is not infrequently supplemented by adductor tenotomy in the groin. The original deformity may be corrected, but in its place in some cases an even more crippling handicap is left. The previously adducted limbs now lie abducted, laterally rotated and flexed, and thus a child previously capable of assisted walking may be unable to walk at all.

In two such cases I have transferred the hamstring muscles to restore the power of adduction.

CASE REPORTS

Case 1—A man aged twenty-one was admitted with cerebral palsy, spastic in type, complicated by dislocation of the left hip. The patient had already been subjected to many surgical operations in an attempt to correct the dislocation of the hip and to overcome the severe flexion-adduction of both thighs. As a result the left hip had been reduced but, in consequence of a previous extensive adductor tenotomy and obturator neurectomy, the right leg lay in

FIG. 1
Case 1. Figure 1—Before operation. Figure 2—After transfer of the hamstrings to restore power of adduction.
1. TREATMENT OF ADDUCTOR PARALYSIS BY HAMSTRING TRANSPOSITION

Fig. 3
Case 2—Photograph showing the marked abduction and lateral rotation deformity on the left side. (Right leg in post-operative plaster.)

Fig. 4
Case 2. Figure 4—Deformity corrected. Figure 5—Patient walking for the first time in her life.
abduction and lateral rotation (Fig. 1). Treatment by transfer of the right hamstring muscles was done in two stages. Twelve months later he was able to adduct the right thigh to the mid-line (Fig. 2) against gravity.

Case 2—A girl aged twenty-five was admitted with cerebral palsy, affecting all four limbs. In consequence of a previous obturator neurectomy followed by an adductor tenotomy she had lost the power to adduct the thighs. The legs lay abducted, laterally rotated and flexed (Fig. 3).

On each side the hamstring muscles were transplanted in two stages. Six months after the final operation the patient was able to walk in a trolley, and two months later with a walking aid (Figs. 4 and 5).

TECHNIQUE OF OPERATION

The hamstring muscles are suitable for transposition because they possess a comparatively long and mobile neurovascular bundle, because very little realignment is necessary and because their fibre length is comparable to that of the adductor muscles.

The tendons of the biceps and of the semitendinosus and semimembranosus are exposed and divided about an inch from their insertions. The semitendinosus and semimembranosus tendons are threaded through a single tunnel drilled on the medial side of the lower end of the femur and sutured to themselves and to the adjacent periosteum or adductor magnus. The tendon of the biceps, which is often broad, may have to be cleared of muscle tissue and split before it can be pulled through a hole drilled on the lateral side of the femur. It is then sutured back to itself or to its divided half and to the periosteum.

Transfer of the hamstring origin from the ischial tuberosity may be performed at the same time, or it may be delayed for two months. This stage is performed most easily with the patient in the lithotomy position. Through a J-shaped incision (the short limb running towards the pubis) the origin of the hamstring muscles is exposed and the neurovascular
bundle is identified to the lateral side. The muscle origin is removed with a thin slice of bone by means of a chisel (Fig. 6). The inferior pubic ramus is identified and the bone exposed subperiosteally as near to the symphysis pubis as possible, care being taken to avoid damage to the urethra or pudendal vessels. The hamstring origin is attached to the symphysis or to the adjacent part of the pubic ramus with a wire suture. This is done best by drilling one or two small holes in the pubis to ensure a firm attachment, which is reinforced further by suturing the reflected periosteum over the hamstring origin with its attached bone flakes (Fig. 7). After the operation the limb is immobilised in a plaster spica for two months. Thereafter active exercises are begun under the care of the physiotherapist, at first in the pool.

**COMMENT**

In each of the two cases described a most satisfactory degree of correction of the disabling deformity was obtained. Within a year the limb could be adducted actively to the mid-line; the strength of the transposed muscle was assessed as Grade 3. Both patients were able to walk straight-legged with support—in the second case, for the first time in her life.

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