

# EARLY SURGERY IN POLIOMYELITIS

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In developing countries the poliomyelitis are usually brought late for proper management; parents, basic doctors, and patients remain either ignorant or develop negative attitude towards this disease; orthotics, even though supplied free of cost, are hardly/sparingly used; social medical workers' coverage remain negligible—in such situations majority of the patients ultimately land up in gross deformities, marked shortening, contractures, subluxation/dislocations of the joints and faulty postures and gait.

It is becoming more and more controversial, especially under the dictates of Western literature and books which have more or less stopped applying attention and space to deal with the prevention and/or correction of the attack of the disease and/or deformities. Rather they have adopted the attitude of compassion against the residual poliomyelitis and clinicians of the developing countries. It appears quite logical that surgical intervention should be done only after the patient reaches the age of understability, co-operation and maturity. However, till that time the child must be cared by regular assessments; needed exercises; proper orthotics; timely soft-tissue or bony operations, regular follow up, care of sociomedical workers, physiotherapist and rehabilitation surgeons. Let us frankly admit, that the above norms are hardly followed, and that too in quite a few patients. The majority of the rest have to suffer resulting in shortened limb, grossly deformed joints and markedly weak (even flail) limbs.

Considering the above we are now convinced that early surgery has a great role to

play (i) in preventing the deformities and gross limb length disparity; (ii) correcting deformities if they are developing or developed (in neglected cases deformities start developing even by 3 weeks); (iii) minimise the extent, the bulk and intricacy of orthotics; (iv) retarding the possibilities of subsequent stabilising procedures; (v) and above all boosting up the morale of patients and parents in developing positive attitude towards the disease and the utility of life (even if with paralysed limbs). Early surgery in polio-paralysis can be basically divided into :

(A) **Ballancing procedures** play great role by virtue of (i) controlling the flailism (ii) depressing the deforming forces (iii) developing the otherwise dormant weaker group of muscles (iv) improving the stability of weaker limbs (v) minimising the bulk, extent and intricacy of orthotics (vi) providing favourable environment for the ballanced growth of the limb (vii) preventing otherwise inevitable deformities (viii) by even proving as definite final procedure.

Such procedures can be done by the age of 18 months onwards and even after 6 months of attack of poliomyelitis. They prove more useful in the lower limbs. Fortunately the muscles tendons which appear as such useless (with minimal power) can be utilized to ballance the joint. Peroneus brevis has been mostly utilized around ankle and foot followed by flexor hallucis longus, extensor hallucis longus, tibialis anterior and so on, mainly to check the lateral instability and foot drop. Around the knee, a rolled band of fascia lata, semitendinosus, and gracillis tendons have been used. Around shoulder, extended

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fibrotendinous slip of trapezius has been utilized.

After the long follow up, this simple procedure has been seen to serve much more purpose than for which it was commissioned. Of course in few instances it even started producing the opposite deformity (to that where it was used to balance) eg. peroneus brevis, used to balance the foot drop, started producing calcaneus.

**(B) Extra-articular fusions :** The principle of such operations are well thought of. The most useful site for such procedure has been the sinus tarsi, for subtalar fusion to check the lateral instability of hind and mid foot. A segment of subperiosteally resected fibula passed from the neck of the talus through the sinus tarsi in the body of calcaneum was observed to be more reliable procedure than the screws. The blocking of the sinus tarsi with trapezoid shaped tibial graft or synthetic spacers/screws had, on the whole, less reliable results. In the upper limb, more or less extra-articular fusion of flail shoulder was done from the age of 5 onwards, using a conical tibial graft across the acromion into the medullary cavity of humerus. On the whole, it provided a fairly sound base for transferring of tendon to improve the abduction, besides the cosmetic effect.

**(C) Dynamic tendon transfers :** To work as definitive procedure it must be done at age when the child is wise enough to understand and obey the command for active exercises and utility of the transferred tendon. Unfortunately, though expected, at few occasions only, the tendons with good power are available for transfer as an isolated procedure. Some basic supportive procedures, like balancing and stabilization, were found to be useful adjuvant to dynamic tendon transfers. Comparatively the primary tendon transfers appear to have more useful roles in the upper limb than the lower, where stabilization procedures proved to be more useful.

**(D) Stabilization procedure :** Hitherto recommended age for stabilization procedures is only after skeletal maturity. Dominating

cartilaginous element; damage of ossific nucleus; affection of dimensional growth of the bones and zones are main objection against performing the stabilization procedures at early age. These objections appear genuine. However, waiting till the age of skeletal maturity without proper care and follow ups of the paralysed children, will have probably much more adverse effects than carefully and properly done stabilization procedures at younger age.

Considering the aforesaid, stabilising the joint at early age has been practised and observed to be rewarding. After providing the base of stabilization it was seen that otherwise dormant muscles have developed even upto the level of power four or more. The apprehension for fusion did not appear true in majority of cases. Even if there was pseudoarthrosis of any joint, the overall shape, size and stability of the joint remained quite acceptable. We performed modified triple arthrodesis, whenever indicated, from the age of seven onwards with almost uniform success.

For flail ankle and foot, modified pantalar arthrodesis (without affecting the growth from lower growth plates of tibia and fibula) has been successfully performed beyond the age of eight and a half years.

In upper limb, arthrodesis of the wrist has been done from the age of three onwards (for flail wrist), utilizing the transmedullary fixation of subperiosteally resected ulnar segment pegged from radius to third metacarpal. Surprisingly there were variable recovery in the muscles controlling the fingers and thumb in good number of cases, besides cosmetic hands in all.

**(E) Osteotomy :** If the growth plate is avoided, osteotomy of a bone can be done at any age. In poliotics of early age, the following osteotomies have been performed with obvious benefits. To correct, the varus with or without cavus and/or adduction of the foot; 'T' osteotomy of calcaneum has been successfully done from the age of three onwards.

In managing the calcaneus/calcaneo-

valgus/calcaneo-cavo-valgus, the calcaneal-sling-sliding-osteotomy has proved its definite role. Along with this, plication of tibialis posterior tendon helped in creating the longitudinal arch of the foot. For moderate to severe cavus of foot with or without varus and mild to moderate clawing of the toes, "Obliquesliding-osteotomy" of the foot, was observed to be superior procedure than the Dwyer's and Japas osteotomies.

Reeds osteotomy of tibia for correction of residual bowing, and supracondylar corrective osteotomies of femur for genu valgum and varum, have been performed at the age of four onwards.

Subtrochanteric de-rotation and/or pelvic supporting angulation osteotomies have been done to improve the stability of paralysed hip. Salter's innominate osteotomy has also been done to improve the stability of the paralysed dislocated hip.

**(F) Surgery for limb length disparity :** Fortunately the limb length disparity at early age has been seen to be less than 3 cms in most of the cases. As the range is within compensation by boots, the lengthening procedures can be withheld till the age of maturity. However, so to say, physiological lengthening (by circumferential subperiosteal stripping at the growing ends of the affected bones) has been observed to be worthwhile trial procedure beyond the age of four years. In our series we have achieved the gain in length upto 4.2 centimeters by this technique.

#### SUMMARY :

We have tried to put our crystalised experiences of performing more than four thousand early surgery in the patients of polio paralysis with overall gains in majority of them.

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