ORIGINAL ARTICLE

Frequency of Various Post Polio Deformities in Lower Limbs and There Correction with Conventional Procedure at Mercy Teaching Hospital Peshawar

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ABSTRACT

Objective: To evaluate the outcome of various post polio deformities in lower limbs and their correction by conventional surgery.

Study design: Descriptive case series

Place of Study and duration: Orthopedic department, Mercy Teaching Hospital, Peshawar Medical College, Peshawar, KPK, Pakistan. Study carried out from January 2008 to December 2012.

Methodology: It is a study that included all patients who needed surgical intervention for Post polio lower limb deformities. The data of all the patients with deformity and procedure was entered on a Performa and the results analyzed with SPSS version 14.

Results: There were 30 patients with 12 (40%) males and 18 (60%) females. Mean age was 16.73 years (range 08-30 years). Among 30 patient 24(80%) had ankle and foot deformity, 3(10%) patient had knee deformity, 2(6.67%) had deformity of hip joint and 1 (3.33%) with leg length discrepancy. Among ankle and foot deformities 7(29.17%) had Equinovarus deformity, 5 (20.82%)had clawing of great toe, 4 (16.67%) had cavus deformity at midfoot level along with clawing of toes ,3(12.5%) Equinovalgus deformity, 2(8.33%) cavovarus ,1(4.17%) had cavovalgus,1(4.17%) calcaneovalgus and 1(4.17%)with flail foot. In knee all three deformity were fixed flexion deformity of 30 degree. In hip there was abductor contracture in 2 patients.

Conclusion: Conventional methods are less cumbersome, economical, need less instrumentation and usually give good results.

Key words: Polio, Post poliomyelitis Syndrome, Foot, Ankle, Knee, Hip, Deformities.

INTRODUCTION

Pakistan and Afghanistan have the largest incidence of polio.[1] Fifty percent of polio cases from all over the world have been reported from these two countries.[1,2] The correlation of increased incidence of polio cases in Pakistan and Afghanistan since 2006 is a decrease in estimated vaccination coverage and population immunity against poliomyelitis.[1]

In the present scenario rational and relevant management to post polio residual paralysis of lower limb is important in these countries.[3] Most of the cases have paralysis of lower limb causing disorders of gait.

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They have different deformities and disabilities of different degrees. They require early detection, treatment, prevention and vocational rehabilitation. Physiotherapy and orthosis can correct initial deformities that remain dynamic.[4] These deformities become fixed with passage of time due to imbalance in muscle power and contracture develops around ankle, knee and hip joint.[5] Limb length discrepancies also occur in severe cases. Ambulation requires a stable plantigrade foot with uniformly distributed weight between the heel and forefoot.[6] Development of contractures is prevented by performing Muscle transfer, to balance the muscles responsible for inversion, eversion, for dorsiflexion, plantar flexion and to reestablish as nearly normal a gait as possible. These deformities disturb gait and are ugly looking.[7] The deformity commonly increases with age and is not usually prevented by orthopedic appliances. These deformities are either corrected by tendon transfer or arthodesis or osteotomies.[7,8] Tendon transfer is used to replace function of a

paralyzed muscle or muscles with active muscle power, to eliminate the deforming effect of a muscle when its antagonist is paralyzed, and to improve muscle balance that improves stability.[7,9] Arthrodesis that has been used to correct deformity or stabilize the joints has to be delayed until 10 to 12 years of age to allow for adequate growth of the foot.[10]Osteotomies and fusions of various joint can be performed to decrease need of orthosis when the bone has been matured and when most of tendon for transfer is not available.[10] The objective of this study is evaluate the outcome of various post polio deformities in lower limbs and their correction by conventional surgery.

PATIENTS AND METHODS

The study was conducted in Mercy Teaching Hospital that included all patients who needed surgical intervention for Post polio lower limb deformities. All the patients of post polio limb deformities that had been operated from January 2008 to December 2012 were included in the study. Procedure performed were tripple arthrodesis, tendon transfer, osteotomies, limb lengthening and tenotomies. All these patients were followed up, at 2 weeks, 6 weeks, 3 months, six months and at one year. Improvement in their deformities and any complication was noted. The data of all the patients with deformity and procedure was entered on a proforma and the results analyzed with SPSS version 14.

RESULTS

There were a total 30 patients with 12 (40%) males and 18 (60%) females. Mean age was 16.73 years (range 08-30 years). Among 30 patients, 24(80%) had ankle and foot deformity, 3(10%) patient had knee deformity, 2(6.67%) had deformity of hip joint and 1 (3.33%) with leg length discrepancy.

Among ankle and foot deformities, 7(29.17%) had Equinovarus deformity, 5(20.82%) had clawing of great toe, 4(16.67%) had cavus deformity at midfoot level along with clawing of toes, 3(12.5%) Equinovalgus deformity, 2(8.33%) cavovarus, 1(4.17%) had cavovalgus, 1(4.17%) calcaneovalgus and 1(4.17%) with flail foot. In knee all three deformity were fixed flexion deformity of 30 degree. In hip there was abductor contracture in 2 patients. (Table 1)

In procedures around ankle and foot 7 patients with Equinovarus deformity, 4 patients were skeletally mature had under gone triple arthrodesis. In addition to arthrodesis, tibialis anterior was transferred to mid foot in 2 patients, tibialis posterior to dorsum of foot in 1 patient and peroneous longus to dorsum in 1 patient. At final follow up these patients were ambulant without any orthosis and their recovery was eventless. Three patients were growing children with Equinovarus deformity that under gone tibialis posterior transfer to dorsum of foot in 2 patients and planter fascia release along with Jones procedure in 1 patient. Modified Jones procedure was performed in all 5 patients of clawing of great toe. Hibbs and Jones procedure was done in 4 patients of Pes cavus along with clawing of toes and 1 patient of cavovalgus deformity. Two cases with Cavovarus deformity was corrected with triple arthrodesis along with Hibbs and Jones procedure. Triple arthrodesis with peroneous longus transfer to mid foot was done in 3 Equinovalgus deformity and 1 calcaneovalgus deformity. One patient with flail foot undergone Pantalar arthrodesis. At final follow up all these patients were able to walk without cruthes or stick. In two patients of Hibbs and Jones procedure there was infection at 6 weeks that was treated with debridement, dressing and antibiotics. One (2.5%) patient had recurrent Equinovarus deformity in which tibialis posterior was transfer to dorsum of foot.

Supracondylar extension osteotomy was performed in 3 patients with fixed flexion deformity of the knee. Out of these three patients, two patients needed the knee ankle foot orthosis and the other one walk independently. The osteotomy was healed in 3 to 4 months time. Ober and Yount procedure was performed in 2 cases of hip abductor contracture. After healing of wound, these two patients needed hip knee ankle foot orthosis for walking.

Total procedures performed were 40 in which triple arthrodesis were performed in 10(25%) patients, tibialis anterior transfer in 1(2.5%), tibialis posterior transfer in 4(10%), peroneous longus muscle transfer in 5(12.5) c, Hibbs and Jones procedures in 7(17.5%), modified Jones procedure in 6(15%), Supracondylar femoral extension osteotomy in 3(7.5%) c, Ober and Yount in 2(5%), bicep to quadriceps transfer in 1(2.5%), Pantalar arthrodesis in 1(2.5%) and limb lengthening in 1(2.5%) patient.

Table 1:

DEFORMITIES			
	Frequency	Percent	Cumulative Percent
Equinovarus	7	23.3	23.3
Fixed flexion defority	3	10.0	33.3
Pescavus with clawing toes	4	13.3	46.7
Flail foot	1	3.3	50.0
Equinovalgus	3	10.0	60.0
Cavo valgus	1	3.3	63.3
Abductor contracture	2	6.7	70.0
Hallux valgus	1	3.3	73.3
Cavovarus	2	6.7	80.0
Clawing big toe	4	13.3	93.3
Calcaneovalgus	1	3.3	96.7
Leg length discrepancy	1	3.3	100.0
Total	30	100.0	

DISCUSSION

In poliomyelitis foot deformities are the commonest. Calcaneal deformity is more common amongst all the foot deformities.[11] The characteristic deformity of the heel with secondary cavus deformity of the foot, frequent presence of valgus or occasionally varus deformity of forefoot and typical thumping gait with less of springiness of normal gait are very well known abnormalities.[11] Choudhury et al[11] study showed that different types of foot deformities in as many as 145 (72.5%) cases out of 200 while in current study there was 24(80%) deformities of foot out of 30 cases.

Khani et al[12] included 30 patients in his study with post polio ankle deformities who needed surgical intervention. He included 18 males and 12 females in his study while in the current study there are 12 males and 18 females. In his study equines deformity was the most common and pes calcaneus was the least common which is comparable to our study.

Zouari et al[13] studied the results of supracondylar femoral extension osteotomy and achieved hundred percent success while in the current study there are three cases with supracondylar femoral extention osteotomy that have also 100% success rate. In his study three cases of septic arthritis that led to stiff knee, which was not observed in current study. In Zouari et al[13] study bone fusion was achieved in all cases which is comparable to our study in which fusion was achieved with in three months. In his study 5 cases had recurrent flexion contracture that required the same procedure in three cases. In nineteen patients knee orthosis was required while others walk independently. In the current study all the patients walk without orthosis. De Moraes et al[14] treated 49 knees with knee flexion deformity with mean follow-up 15.5 (11.5-25) years. Postoperatively, they achieved full extension in 22 knees, an extension lag of 1-10 degrees in 26 knees and lag greater than 10 degrees in one knee. There were no neurovascular complications and all patients were fitted with long leg braces. While in our study there was no extension lag and no complication.

Faraj AA[15] carried out study on 12 patients with postpoliomyelitis clawing of the big toe treated by a modified Jones procedure with 32 months of follow-up. In his study two patients had fair results and ten patients had good results while in our study modified Jones procedure was done in 6(15%) cases that have good results. Faraj AA[15] transferred extensor hallucis longus in two patients which became loose with coexistent tight tendochilles. In both of these patients, cavus deformity occurred 3 months after the operation. Shortening of the transferred extensor hallucis longus and lengthening of the tight tendoachilles was done in these patients.

CONCLUSIONS

In management of post polio deformities in limbs conventional methods are less cumbersome and economical. Conventional methods need less

instrumentation and usually give good results, however surgical planning is important, especially in severe deformities, where shortening is necessary to relax the neurovascular structures.

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