



Orthopedic

MANAGEMENT OF RELAPSE CLUBFOOT BY PERCUTANEOUS TENDON RELEASE WITH APPLICATION OF CORRECTIVE CAST AND ANALYSIS OF RESULT THROUGH PIRANI SCORE, PODOGRAPH FOOT BIMALLEOLAR ANGLE, RADIOLOGICAL FOOT ANGLES AND FUNCTIONAL FOOT SCORE.
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ABSTRACT
Aim:-The aim of our study to evaluate the effectiveness of percutaneous tendon release and application of corrective cast in children who had undergone serial corrective cast but had some Residual deformity

Material and method :-We have included total 18 patient of Relapse clubfoot (with 22 clubfeet) in our study. The age group of patient between 6 month to 36 month. All these patient treated by percutaneous tendon release procedure and application of corrective cast. then result analysis by pirani score, podograph foot bimalleolar angle, and radiological foot angles at follow up of 1, 6, 12 month.

Result:-pirani score result excellent in 10 feet (score < 0.5), good in 10 feet (score < 1.5), and fair in 2 feet (score < 2).

Podograph foot bimalleolar angle (FBA) in 19 feet (87%) [angle > 75°], FBA in 2 feet (9%) [angle 70-74°], FBA in 1 feet (4%) [angle 65-69°].

Radiological foot angle AP Talocalcaneal angle mean change (7.42°), lateral Talocalcaneal angle mean change (7.09°), AP Talofirst metatarsal angle mean (7.0°), Tibiocalcaneal angle mean change (18.66°), Talocalcaneal index mean change (14.65°)

Laavegponseti and Cummings functional score excellent (85-100) in 4 feet (18%), Good (70-84) in 12 feet (54%), fair (60-69) in 3 feet (14%), Poor (below 59) in 3 feet (14%).

Conclusion:-Percutaneous tendon release with application of corrective cast is safe and easy method for correction of Relapse clubfoot with less risk of wound complications, neurovascular injury and post operative scar mark.

KEYWORDS : percutaneous tendon release, pirani score, podograph foot bimalleolar angle, radiological angles, functional foot score.

INTRODUCTION

Congenital talipes equinovarus deformity occurs one in 1000 live birth. {1} Regardless of the mode of treatment the clubfoot has a strong tendency to relapse. Relapse may then occur as a result of incomplete correction or inadequate attention to long term slinting. Significant controversy still present regarding type of best surgical modality for relapse. Dunkley et al recently showed low efficiency of repeated casting with 86% of patient relapsing after failure of ponseti method. {2} McKay et al found repeat casting and bracing for late relapsing failed in 94% of cases. {3} Richards et al suggested some patient do not respond well to conservative approaches despite additional attempt. There for surgery should not be avoided. {4} In this study Relapse clubfoot corrected by percutaneous Tendon release with application of corrective cast and result assessment through pirani scoring, podograph (FMA), Radiological foot angle's and laavegponseticummings functional score.

AIMS AND OBJECTIVES

The aim of our study to evaluate the effectiveness of surgical intervention and corrective cast in children who had undergone serial corrective cast but had some Residual deformity.

MATERIAL AND METHODS
Study Design :- Prospective study

Study Centre :- Department of orthopaedics in N.S.C.B. Medical College, jabalpur.

Duration of Study :- 1st jan 2019 to 31 August 2020

Sample Size :- Minimum 20 feet with club foot deformity

Inclusion Criteria :- All Relapse clubfoot before treated by ponseti cast method

EXCLUSION CRITERIA:-

All idiopathic clubfoot below 6 month of age

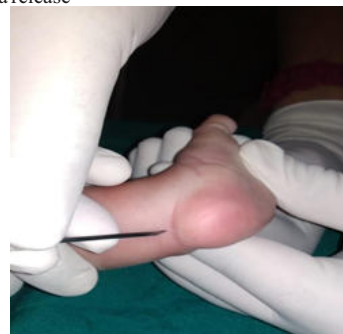
METHOD :-

We have included total 18 patient of Relapse clubfoot (with 22 clubfeet) in our study. The age group of patient between 6 month to 36 month. Surgery was done short GA with patients in supine position. A thigh tourniquet was used. knee was extended and foot in dorsiflexion position as much as possible so that ligament become

taut. With help of 18 no. needle or 11 no. surgical blade directly over planter fascia origin and release it for correction of cavus. Next percutaneous Tendoachillis release by medial side of tendon with the foot maintain in full dorsiflexion position for correction of equinus deformity. After that great toe was assessed in full dorsiflex position of foot and if it was found to be tight, then percutaneous release of flexor hallucis longus at mid point of proximal crease of great toe at metatarso-phalangeal joint. Deformity always need to be correction in sequence first planter fascia, than Tendoachillis and in last Flexor hallucis longus.



planter fascia release



Tendoachillis release



Flexor hallucis longus release

After correction of deformity apply above knee cast in maximum correction for 2 week and after 2 week maintenance of correction by foot abduction orthosis



Post op assessment of patient through pirani scoring system, podograph (foot bimalleolar angle), radiographic (foot angle) and laavegponset and Cummings functional score.

Follow up assessment at 1 month,6 month and 1 year



Pre op



Post op

OBSERVATION AND RESULT

Piraniscore :-On basis of pirani score grading.
 Excellent in 10 feet (45%) [<0.5 post op pirani score]
 Good in 10 feet (45%) [<1.5 post op pirani score]
 Fair in 2 feet (9%) [<2 post op pirani score]

Podograph :- (Foot bimalleolar angle)
 Foot bimalleolar angle improved in 19 feet (87%) [angle $>75^\circ$]
 Foot bimalleolar angle improved in 2 feet(9%) [angle 70-74°]
 Foot bimalleolar angle improved in 1 feet(4%) [angle 65-69°].

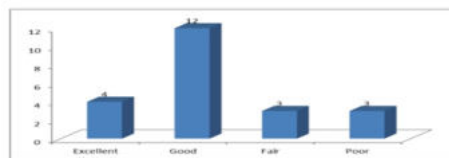
Radiological Foot angles

Foot angles			
	Pre op mean	Post op mean	Mean change
AP Talo calcaneal angle	15.41 \pm 3.76	22.83 \pm 3.17	7.42°
Lateral Talo calcaneal angle	16.69 \pm 2.91	23.39 \pm 2.86	7.09°
AP Talo first metatarsal angle	13.69 \pm 23.37	6.68 \pm 4.57	7.0°
Tibio calcaneal angle	57.40 \pm 6.31	76.07 \pm 6.88	18.66°
Talo calcaneal index	31.66 \pm 6.62	46.32 \pm 5.38	14.65°

Laaveg ponseti and Cummings functional score

PONSETI LAAVEG AND CUMMING'S FUNCTIONAL SCORE

Relapse clubfoot			
Excellent	85- 100	4	18%
Good	70-84	12	54%
Fair	60 -69	3	14%
Poor	Below 59	3	14%



DISCUSSION

Management of relapse deformity remain controversial. The surgeon has to decide whether to continue with non - surgical treatment , to perform surgery or may include both combine techques. There are also questions regarding the type of surgery. There is no clear agreement on whether patient should have a comprehensive release or minimum staged surgery as necessary.

Operative age The optimal age for surgical intervention has always been controversial. Turco recommends surgery should be done after one year of age when foot size allows for easier identification of the structure. Carolls et al recommends surgery done at around 2 month because at this time foot is sufficient size to identify pertinent anatomy at time of operation. Franke and main demonstrated better results are obtained when posterior or posteromedial release are performed in patient younger than six month. DePuy J, et al, Hutchings PM et al, Otremski I et al, Reichel H et al, Tibrewal SB et al think surgery should be done by the age of 3-6 months as it would be easier to achieve the correction.

Piraniscoring Dr.lakhansinghmaravi et al given triple percutaneous needle release technique for relapse clubfoot. Thier results on pirani score system basis, over 20 clubfeet of 15 patient. Result are excellent in 5 feet(25%), good in 12 feet(60%), fair in 3 feet(15%). In our study Results are excellent in 10feet(45%), good in 10feet (45%) and fair in 2feet (9%). In thier study results based on pirani score only and our study we also explain about change in podograph (foot bimalleolar angle), radiographic foot angle, and functional score. S.S park and S.W.kem at al reported in their study over 13 recurrence and residual clubfeet mean piraniscore before surgery is 2.8 point reduced to 1.1 point.

In our study mean piraniscore before surgery is 3.6 point reduced to 0.4 point.

Podograph (foot bimalleolar angle) Jain AK et al concluded that foot bimalleolar angle is a good representative of the severity of deformity and it has good correlation towards successful outcome. Vikas Trivedi et al reported foot bimalleolar angle is significant related to functional outcome. Denis et al observe significant correlation between foot bimalleolar angle and functional outcome. We also found significant relationship between foot bimalleolar angle and functional score. Radiological foot angle's. In our study Talocalcaneal index mean improved from 31.66° to 46.32° and Tibiocalcaneal angle mean improve from 57.40° to 76.07°. S.s.park and B.S.jung et al reported mean Tibiocalcaneal angle improved from 87.4° to 69° and Talocalcaneal angle mean improved from 40.4° to 52.1°. Radler et al reported significant improvement in

Tibiocalcaneal angle. {16} GBS Varun et al reported no significant relationship between talocalcaneal index and Tibiocalcaneal angle to functional score. {17} Denis et al reported significant relationship between Talocalcaneal index and functional score. Beatson and Pearson et al, Hutchins et al, porat and kalpan show strong correlation between talocalcaneal index and functional score. {18}

In our study Talocalcaneal index and Tibiocalcaneal angle significantly related to functional score.

McKay et al reported in 71% cases good to excellent functional result in their study. {3} Simon's reported in 72% cases good to excellent functional score. {19,20} Magone et al reported in 63% cases good to excellent score. {21} Turco reported 84% good to excellent functional score. Centel et al reported in 66% cases good to excellent score in their study {22}. Atta et al reported in 66% cases good to excellent functional score. {23}

In our study laaveg ,ponseti and Cummings functional score in 75% clubfoot good to excellent

CONCLUSION

Percutaneous Tendon release with application of corrective cast is safe and easy method for Relapse clubfoot with decrease risk of wound complication, neurovascular injury and post operative scar mark.

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