



TO ACCESS THE FUNCTIONAL OUTCOME OF MODIFIED CHOPART AMPUTATION DONE BY SACRIFICING THE HEAD OF TALUS TO ACHIEVE SOFT TISSUE COVERAGE OVER ANTERIOR ASPECT OF CALCANEUM IN PATIENTS WITH NONSALVAGEABLE FOOT INJURIES WITH INTACT HEEL –A RETROSPECTIVE STUDY

Orthopaedics

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ABSTRACT

Introduction - Disarticulation through the midtarsal joints was first performed by Francois Chopart in the late 18th century. Chopart amputation was used for the treatment of diabetic gangrene, frost bite, unsalvageable injuries and tumours of the foot. However, it soon fell into disrepute due to the development of progressive equinovarus deformity of the stump, painful callosities and skin breakdown on the anterior aspect of the calcaneum, and poor prosthetic fitting. Soft tissue coverage is of great concern while performing chopart amputation in traumatic foot. Inadequate soft tissue coverage may lead to skin breakdown on anterior aspect of the stump and increase further morbidity of the patient.

Material and method – This is a Retrospective study involving 16 patients with unsalvageable foot trauma with intact heel pad operated at Dr Radhakrishnan Govt. Medical College Hamirpur, Dr Rajendera Prasad Govt. Medical College Tanda at Kangra and Shri Lal Bahadur Shastri Govt. Medical College Mandi at Nerchowk in Himachal Pradesh. Chopart amputation was done in all the patients with sacrificing head of talus to achieve adequate soft tissue coverage. Lieberman et al classification of outcome following Chopart's amputation was used to access the outcome.

Results: Out of 16 patients, we have excellent outcome in 12 patients, Good out come in three patients and fair in one patient

Conclusion – Modified Chopart amputation gives good functional outcome in non salvageable foot injuries. Excising the head of talus helped to achieve adequate soft tissue coverage and prevent breakdown of the skin over the anterior aspect of the calcaneum. Preserving the heel dramatically improve the gait of the patients and overall quality of life.

KEYWORDS

Chopart amputation, Non salvageable, Equinovarus.

INTRODUCTION: Need for amputation is greatly decreased in modern time due to development of recent understanding for prevention and treatment of infection, traumatic injuries, Tumours etc. But still some of non salvageable conditions may require amputation.

Disarticulation through the mid tarsal joints was first performed by Francois Chopart in the late 18th century. This procedure was used for the treatment of diabetic gangrene, frost bite, unsalvageable injuries and tumour of the foot.⁽¹⁾ Because of complications like callosities, equinovarus deformities, breakdown of skin over anterior aspect of the calcaneum and poor prosthetic fitting⁽²⁾, various modifications were done to make it more acceptable to the patient. Subsequently many authors describe modification in the operative technique as well as in prosthetic fitting which resulted in better outcome. These modifications to the original procedure include suturing the dorsal tendons to the neck of the talus and tenectomy of the tendoachilles to avoid equinovarus deformity.

In our study we modified the Chopart amputation by removing the head of the talus to achieve soft tissue coverage and prevent breakdown of skin over anterior aspect of the calcaneum. Lieberman et al classification of outcome following Chopart's amputation was used to access the outcome. All the patients were informed that data would be submitted to the publication and written consent was taken.

MATERIAL AND METHOD:

In our study 16 patients with nonsalvageable crush injury foot was taken and operated at Dr Rajendera Prasad Govt. Medical College Kangra at Tanda, Shri Lal Bahadur Shastri Govt. Medical College Mandi at Nerchowk and Dr Radhakrishnan Govt. Medical College Hamirpur Himachal Pradesh during August 2015 to May 2019. Written consent was taken from all patients regarding amputation. All patients with crush injury foot with intact heel pad included (Photo1).



Photo1: Photograph showing 15 days old infected crush injury Left foot with exposed bones

Amputation at the level of talonavicular and calcaneocuboid joint was performed with identification of tendon of tibialis anterior. Tendon of tibialis anterior was anchored on the neck of the talus along with other dorsal tendon and tendoachilles tenectomy (removing 2-3 cm of tendon) was performed to prevent equinovarus deformity of the remaining stump. To achieve adequate soft tissue coverage over anterior aspect of the calcaneum, we sacrifice the head of the talus. Wound was closed over corrugated drain (Photo 2). Two patients having raw area over anterior aspect of the stump required split skin grafting (Photo3).



Photos 2 : Immediate postoperative. Anterior closure is possible after excision of head of talus.



Photo3: Photograph after Split skin grafting

Sutures were removed after 2 weeks. The patients were placed in a slight dorsiflexion rigid dressing for 6 weeks to prevent equinus deformity and allow for incorporation of the transferred ankle dorsiflexors. After stump healed patients allowed to walk even without prosthesis (Photo 4,5).



Photo 4: Photograph at followup at 6 months

Lieberman et al (1993) classification of outcome following Chopart's amputation was used to access the outcome based on skin condition, prosthesis and pain⁽³⁾ (Table I).

Table I: Lieberman et al Classification

Lieberman et al classification of outcome following Chopart Amputation	
Excellent	No callus formation or ulceration and able to wear the prosthesis without discomfort
Good	An episode of stump breakdown or callus formation with subsequent healing. Able to wear the prosthesis with occasional minimal discomfort
Fair	Multiple episodes of stump breakdown or callus formation. Mild to moderate discomfort in the prosthesis and pain in the foot.
Poor	Failure of amputation or severe pain in the foot

Results:

We have operated 16 cases at Dr Radhakrishnan Govt. Medical College Hamirpur, Dr Rajendra Prasad Govt. Medical College Kangra at Tanda and Shri Lal Bahadur Govt. Medical College Mandi at Nerchowk from August 2015 to May 2019. Out of 16 patients, 15 were male and one was female. Most common cause for amputation was non salvageable foot injury due to trauma following road side accident. Followup period ranges from 4months to 3years 9 months. We have achieved adequate soft tissue coverage over anterior aspect of calcaneum after excision of head of talus. We have excellent outcome in 12 patients, Good outcome in three patients and fair in one patient (Table II) (Figure 1).

Table II: Functional Outcome according to Lieberman et al Classification

Score	No of Patients	Percentage
Excellent	12	75%
Good	3	18.75%
Fair	1	6.25%

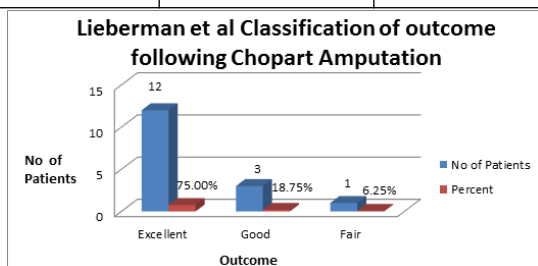


Figure1: Functional Outcome according to Lieberman et al Classification

DISCUSSION:

The first Chopart's amputation was described as a disarticulation through the midtarsal joints with none muscle balancing. The unopposed gastrocnemius caused an equinus deformity of the hindfoot stump resulting in painful callus formation and skin breakdown over the anterior portion of the stump. This led to reamputation at a far better level in many cases. Proper prosthesis fitting was also compromised. These setbacks led to a gradual abandonment of the procedure.⁽⁴⁾

These setbacks results in the modifications within the Chopart Amputation and prosthesis utilized in it. By transferring the dorsiflexors of the ankle and lessening the planter flexion strength of the Achilles tendon by removing the 2-3 cm of tendon instead of an easy lengthening results in good functional outcome.⁽⁵⁾

McDonald (1955) had good functional outcome in one patient following modification in prosthesis. He also described transfer of Dorsiflexors of ankle joints to the talus to counter the action of gastrocnemius.⁽⁶⁾

Christie et al (1980) good functional outcome in three patients and stressed that careful relocation of the dorsiflexors of the ankle could prevent equinovarus deformity of the hind foot which stump act as a platform for weight bearing.⁽⁷⁾

To salvage tarsometatarsal and midtarsal amputation during which fixed equinus deformity has developed, both Burgess and Lieberman et al recommended division of the Achilles tendon and placement during a rigid dressing in slight dorsiflexion for six weeks. this is able to correct the equinus deformity and weight would be borne on the planter skin of the heel and remaining a part of the foot.

Zaricynj described the prevention of equinus deformity by Tibiotalar arthrodesis.⁽⁷⁾

In our study additionally to transferring the dorsiflexors to the talus and tenectomy of Achilles tendon, we excise the Head of the talus to provide adequate soft tissue coverage over anterior aspect of the Calcaneum and achieved Good to Excellent result.

CONCLUSION:

Chopart amputation is straightforward to perform and advantages of this procedure over Syme's amputation are that the hind foot height and heel proprioception are retained.

Modified Chopart amputation gives good functional outcome in non salvageable foot injuries. In this study by excising the head of the talus helped to provide adequate soft tissue coverage and stop breakdown of skin over the anterior aspect of the calcaneum. Preserving the heel dramatically improve the gait of the patients and patients can ambulate even without prosthesis.

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