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**ORIGINAL ARTICLE**

# Management of Hallux Valgus in adults by Chveron Corrective Osteotomy

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## ABSTRACT

**Background:** Hallux valgus is a complex deformity and although not common but difficult to treat .It started from first row and then involve the entire foot. There are many surgical techniques to treat this problem. Both soft tissue procedures and bony osteotomies are mentioned in literatures but still there is no any gold standard. We used soft tissues procedure and cheveron osteotomy for treatment. Coughlin classification was used to assess the outcome

**Aim:** To assess the outcome of cheveron corrective osteotomy to treat hallux valgus deformity in adult by using Coughlin's classification.

**Methods**: We operated 15 adults patients with hallus valgus in Mayo hospital Lahore between 1-6-19 to 31-12-19 .Both soft tissues and bony procedure were done, Coughlin's classification used to assess the pre operative and post operative deformity.

**Results**: From total 15 patients 5 were male (27.3%) and 10 were female (72.7%). The mean age was 31.63 years (SD =1,689), ranging from 20 to 50 years old. Right side was involved in 4 (26.66%) patients foot affected, left side was involved in 5(33.33%) patients and both sides were involved in 6(40%) patients. Postoperatively, 12 patients (72.7%) showed the first ray angles within acceptable values. All patients had cosmetic correction and 13 patients (90.9%) had relief of pain and suitability for footwear.

**Conclusion:** Chevron osteotomy is effective safe and treatment of choice in adults .

**Key words:** Soft tissues, Hallux Valgus, Chevron osteotomy

## INTRODUCTION

Hallux valgus is not a uncommon condition which commonly producing pain, and deformity both in adult and children. The hallux valgus is a complex deformity consisting of a medial deviation of the first metatarsal, lateral deviation of the hallux, bunion at lateral part of metatarsal and usually overriding of hallux over the second toe Normal intra metatarsal angle (IMA) is about 8º to 9º between the first and second metatarsal and 15º and 20º is angle between the first metatarsal and the hallux (HVA)[1].

The first metatarsal is shortened, medially deviated and hallux is laterally deviated in a simple deformity[2]. First metatarsal shortening leads to alter position of the sesamoids bone increasing space between intermetatarsal resulted in change in shape of the forefoot and muscular imbalance leads to a complex deformity[3]. A congenital involvement is also blamed by many authors[4]. Pain and footwear inadequacy are main factors for the surgery in Hallux Valgus. Many operative techniques are available to treat this disability. The decision on which surgical technique is used depends on the degree of deformity, degenerative changes of 1st metatarsophalangeal joint and the shape and size of the metatarsal bone and phalangeal deviation are important in operative decision. Soft tissue procedures most commonaly used are Duvries-modified McBride operation, Arthrodesis of 1st MP joint (Lapidus and McKeever procedure) is usually done in all kind of deformity to avoid recurrence. Keller, Wilson, Akin and Michell bony osteotomies are commonly used. We are using Chevron osteotomy because it is simple, safe and effective technique.

The objective of the study was to assess the outcome of cheveron corrective osteotomy to treat hallux valgus deformity in adult by using Coughlin's classification.

## MATERIALS AND METHODS

Out of total 15 patients, male were 4 and female were 11. All patients were adults between 20 to 50 years of age. The mean age was 34.35 year. All patients were operated in Mayo hospital between 1-6-19 and 31-12-19. All patients were admitted throughout patients department. Anteroposterior and lateral weight-bearing x-ray of the both feet were done before surgeries. All necessary laboratory investigations were also done.

**Inclusion criteria**

1. Both male and female
2. Age between 20 to 60 years

**Exclusion criteria**

1. Pathological bone
2. Local infection or skin disease
3. Already operated patients
4. Patients with neurovascular disorder
5. Patients with systemic metabolic disorder

**Operation procedure:** All patients were operated under spinal or general anesthesia .Pneumatic tourniquet was also used in ever patients. A mid line incision was given from 2cm above from interphalengial joint line distally .This incision was used up to first tarso metatarsal joint distally. Medial capsulotomy and tenatoy of adductor hallux tendon were done on medial side. Then on lateral side bunioectomy a\and capsullorephy were done Inter phalangeal joint reduced and a 2mm k-wire passed in the joint. A cheveron osteotomy done at the base of 1st metatarsal bone ,Then anatomy restored and same K – wire further passed up to tars metatarsal joint, 2 cross k-wire of 1.5mm passed at osteotomy site .Wound closed in layers. A pop back slab was given .A heavy antiseptic dressing was done also in the first inter phalangeal space.

**Follow up:** Elevation of the limb was advised. On second post-operative day wound examined and patient discharged, Patients wound examined after 7th post-operative day. Stitches removed on 14th day .Then patients were examined after every 15 days for 6th week .X-ray was done after every month to see union All k-wires were removed after 6th post-operative day and partially weigh bearing started pop was also removed. Full weight bearing started when osteotomy site united usually after 2 to 3months post operatively. The variables studied were sex, age, laterality, deformity classification and treatment efficacy. Absolute and relative frequency calculations were performed for all variables. The analysis was performed by the SPSS program 20.

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1. Intermetatarsal angle (IMA)
2. Angular measurements;
3. Hallux valgus interphalangeus angle (HVI);
4. Hallux valgus angle (HVA)
5. Position of the medial sesamoid
6. Distal metatarsal articular angle (DMAA)

## RESULT

Fifteen patients were operated, all patients were available for data. All preoperative data was available for comparison Major indication for surgical correction were deformity, pain and footwear inadequacy. The sample consisted of 04 male (26.66%) and 11 female (73.33%) with p equal to 0.132. The mean age was 31.63 years (SD =1,689), median 31.00 years, maximum 50 years and minimum 20 years.

Total patients were 15, total of 21 surgeries were done by using Chevron osteotomy, since 06 patients had bilateral deformity (40%), 4 patients (26.66%) had right side deformity and 05 patients (33.33%) in the left side

For severity of hallux valgus in the preoperative and postoperative period, we used Coughlin's classification to measure of the HVA and IMA angles on x-ray . In the preoperative period, 03 patients (20%) presented mild deformity, 10 patients (66.66%) presented moderate deformity and 02 patients (13.33%) presented severe deformity. In the postoperative period, 10 patients (66.66%) presented normal angulations (no deformity), 03patients (20.00%) had a mild deformity and 02 patients (13.33%) had a moderate deformity .No infection and implant loosening was noted in any patients We did not used any bone graft.

Discussion

Hallux valgus is a very complex deformity. Etiological cause of hallux valgus are still not clear. Mens and Lord[5], in their study published in 2005 show its relationship with age . Castro et al[6], in his study published in 2009 reported that hallux valgus frequency increased with age especially in female and many other authors showed its relation with age[7] Wilson procedure for deformity correction is considered to be very good procedure but metatarsal bone is further shortened with corrective osteotomy[8]. Both soft tissues and bony procedures are required to avoid recurrence in hallux valgus because there is a increased angle between first and second metatarsal[1]. Mitchell's osteotomy is another good choice but is has following drawbacks, shortening of metatarsal, sometimes dorsal deviation of metatarsal and consolidation time is prolonged[9-12]. Chevron osteotomy has many advantages with fewer complications. The spongy bone is used for osteotomy which need less consolidation time. There is no shortening of metatarsal bone. There is no dorsal deviation of the metatarsal head and is much simple than that of Mitchell's osteotomy. Its major drawback is that it is usually recommended for mild deformities (around 15°), because the distal fragment is short and proximal part is broad. Avascular necrosis is also mentioned by some surgeons; Corlles[13,15] in a series of 148 cases reported 1 patient with necrosis. We have limited number of cases, so future door is opened for future studies

## CONCLUSION

Chevron osteotomy is easy safe and effective technique to treat hallux valgus from mild to severe deformity.

**Conflict of interest:** Nil

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