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**Research Article**

# The Complications of Mckay and Turco Procedure of Club Foot Surgery During Post-Operative and Follow Up Period

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**Abstract:** ***Background:*** The clubfoot is brought on by the calcaneous, which rotates laterally toward the fibular malleolus posterior to the ankle joint and medially beneath the head of the talus prior to the ankle joint. ***Objective:*** To observe the complications of McKay and Turco procedure of Club foot surgery during post-operative and follow up period. ***Methodology:*** This prospective interventional research was conducted from January 2007 to December 2008 at the orthopaedic division of Bangabanghu Sheikh Mujib Medical University in Shahbag, Dhaka. 25 patients with 36 feet were chosen; Group I included 13 patients with 19 feet who had surgery using Mckay's method, while Group II included 12 patients with 17 feet who underwent surgery using Turco's method. The ethical requirements were all met. The researcher himself created and created a questionnaire. Clinical tests, appropriate investigations, and a thorough medical history all helped to establish the diagnosis. Then, two sets of surgeries were performed using the Turco or Cincinnati incision. SPSS (Statistical Package for the Social Sciences) was used to do the statistical analysis. ***Results:*** Men made up 61.53% of McKay's group while women made up 38.46%. These patients had the McKay procedures for stiffness 01(7.69), deformity 01(7.69), and 01(8.33) of Turco's technique. People in group 1 had 7.69% blisters, 7.69% skin necrosis, and 7.69% skin infections in the early post-operative complications stage. In group 2, early post-operative problems included 16.66% blisters, 7.69% skin necrosis, and 7.69% skin infection. ***Conclusion:*** One of the prevalent congenital conditions is clubfoot. Patients with this deformity are treated in large part by surgery. Following surgery, comparative research may be useful. When developing a treatment strategy for a recurrent and chronic deformity after clubfoot surgery, the ultimate function should be taken into account.
**Keywords:** McKay and Turco procedure, Club foot surgery, Complications. Treatment.

## Introduction:

The malformation of the joints that characterizes congenital club foot is very complicated and may take many different forms.[1] By the time a baby is born, secondary and adaptive structural changes in the skeleton and soft tissues are fully entrenched, rendering radiography useless. Mid-tarsal joint abnormalities are assumed to be fundamental, as are the other features of the deformity. Most foot abnormalities, including varus deformity of the heel, are secondary and adaptive, and may be remedied by releasing constricted soft tissues and correcting the original deformity. Clubfoot has been around since the time of Hippocrates. Surgeons have debated the etiology, pathoanatomy, and treatment of this condition for generations. Surgery was not used into the treatment of clubfoot until 1831, when Stroneyer first used tendoachiles lengthening.[2]

The phrase "start the treatment before the delivery of head breech presentation" could not be more appropriate when discussing the need of early clubfoot treatment. The intensity of symptoms has a role in how doctors categorize congenital club foot.[3] There are three types of club foot deformity: adduction, inversion, and equinus. Adduction of the forefoot in relation to the hindfoot. The whole foot turns inside out because [4] the calcaneus of the offside foot is related inward beneath the astragalus. There are two distinct aspects to the equinus deformity. "Forefoot equinus" describes a condition in which the forefoot is more plantar-flexed than the rear foot. A condition known as "ankle equinus" occurs when the foot as a whole is flexed plantarward at the ankle. There is a certain sequence in which these three abnormalities must be fixed. The postural or moderate club foot is unusual and may be easily remedied. The moderate club foot is not too rigid, since there is no transverse wrinkle and the heal is clearly seen. Fortunately, the majority of problems with the targeted foot may be fixed with only moderate manipulation or re-alignment and a plaster cast.[5] In cases with severe club foot, surgical intervention is usually necessary. There is a transverse crease on the sole of the foot, and the skin is quite tight. The medial incision used in the Turco procedure begins at the base

of the first metatarsal and travels proximally beneath the medial malleolus to the Achilles tendon. After lengthening the Achilles tendon and the posterior tibial tendon, and just removing the sheaths of the flexor digitorumlongus and flexor hallucislongus tendons, a blind transaction of the talofibular and calcaneofibular ligament is performed to release the lateral aspect of the posterior[6].

In 1982 and 1983, McKay presented his ideas on the morbid anatomy of the club foot and how to treat it surgically.[7] According to his new theory, the calcaneous rotates medially under the head of the talus anterior to the ankle joint and laterally toward the fibular malleolus posterior to the ankle joint, causing the clubfoot. This theory represents a major departure from the traditional understanding of the condition. For the same reasons, McKay advocates for an early operation on the club foot, even before the age of 2 months. The articular cartilage in the joint may be saved and the talus can develop more fully if surgery is performed early. A transverse Cincinnati incision is made medially from the base of the first metatarsal, laterally around the heel, and down to the level of the calcaneal cuboid joint in order to get access to the foot during surgery[8]. The calcaneal cuboid joint, lateral ankle joint, and subtalar joint may all be seen and released with great clarity thanks to this incision.

Clubfoot is the most prevalent congenital deformity seen at BSMMU's Orthopaedic Outpatient Department in Dhaka. Due to illiteracy, a lack of health education, ignorance, poverty, superstitions, a communication gap, abuse by traditional methods, etc., a substantial proportion of patients often arrive at our facility after they should, but overall, the outcomes of surgery are favorable as long as the right kind is used for each case. As there may be postoperative problems and recurrence until the kid is enrolled in school, patients require postoperative serial plaster, a club foot shoe, and follow-up. The stiff kind of congenital talipesequinovarous deformity is now often treated by less intrusive surgery, according to several doctors.[9]

**Objective:** To observe the complications of McKay and Turco procedure of Club foot surgery during post-operative and follow up period

**Methodology:**

**Type of study:** This is a prospective observational study.

**Place of study:** This study was carried out in Department of Orthopaedic Surgery, Bangabandhu Sheikh Mujib Medical University, Shahbag, Dhaka-1000, Bangladesh.

**Period of study:** 1st January 2007 to 31st December, 2008.

**Sample size:** This study included 25 patients having 36 congenital club foot.

**Study population:** In this research, 25 individuals with 36 feet were included. Surgery was performed on 19 feet using the McKay process, and the remaining 17 feet using the Turco procedure.

**Sampling technique:** Random purposive sampling method.

**Follow up period:** The mean follow up period was in Group- I 8.92±SD2.39 months (range 5 to 13 months) and the mean follow up period was in Group- II 12.08±SD 4.07 months (range 6 to 17 months).

**Inclusion criteria:** A child with an idiopathic congenital club foot, Children's ages range from three months to three years, both sexes, a unilateral or bilateral clubfoot, a rigid kind of club foot.

**Exclusion criteria:** Age must be between three months and three years old, A flexible form of clubfoot, A hard, resistant sort of club foot, Recurring club foot.

**Study design**

The researcher himself created a questionnaire, taking into account important factors like age, sex, presenting complaints with duration, clinical findings, associated medical conditions, investigations, preoperative findings, and surgical outcome that was confirmed by the guide. Following the selection of the patients, the investigator personally communicated to the patient or attendant the study's goals, precise procedures, and benefits in terms that could be understood by both parties. The study's patients were given the flexibility to discontinue at any time, even after they had voluntarily participated, and were even urged to do so. The patients are recruited in this trial if they consent. The secondary spinal tumors were then identified in the appropriate manner. An extensive medical history must be obtained from the patient, and a physical and neurological exam must be performed as part of the diagnostic procedure. In addition, laboratory and imaging tests may provide light on the patient's health that may not be visible during exams.

**Surgical Procedure and techniques:**

Under general anesthesia and a tourniquet, all procedures were carried out. 13 patients in Group I had the McKay treatment on their 19 feet, while 12 patients in Group II underwent the Turco surgery on their 17 feet.

**Statistical analysis:**

The collected data were manually modified. After that, information was input into the SPSS computer program.The entered information was validated and confirmed.The statistical software SPSS

(Statistical Package for Social Science) was used to examine the data.

**Results:**

Table 1 displayed the age distribution of the patients. Most of the patients were in the age range of 6 to 11 years. It was 30.76% in McKay's technique and 33.33% in Turco's operation. The next popular age range was between 12 and 17. It was 23.07% in McKay's operation and 25.0% in Turco's technique.

**Table- 1: Age distribution of patients (n=25)**

| Age group (Months) | McKay's procedure No. (%) | Turco's procedure No. (%) |
|---|---|---|
| Up to 5 | 02(15.38) | 01(8.33) |
| 6-11 | 04(30.76) | 04(33.33) |
| 12-17 | 03(23.07) | 03(25.0) |
| 18-23 | 02(15.38) | 02(16.66) |
| 24-30 | 01(7.69) | 01(8.33) |
| 31-36 | 01(7.69) | 01(8.33) |

Table 2 displayed the patient's sex and surgical procedure distribution. There were 25% females and 75% males in the Turco group. In McKay's group, men made up 61.53% and women made up 38.46%. Through the Pearson $x^2$ test, no statistically significant correlation between the sex distribution of the patients in the various groups was discovered ($x^2$= 1.312, df=1, p= 0.67).

**Table-2: Sex distribution of patients (n=25)**

| Sex | McKay's procedure No. (%) | Turco's procedure No. (%) | P value |
|---|---|---|---|
| Male | 08(61.53) | 09(75.0) | 0.67 |
| Female | 05(38.46) | 03(25.0) | |

Table 3 showed that in McKay's procedure unilateral foot involvement in 7(36.85%) patients and bilateral foot involvement in 6(63.15%) patients. In Turco's procedure unilateral foot involvement in 7(41.18%) patients and bilateral foot involvement in 5(58.82%) patients.

**Table-3: Distribution by foot involvement.**

| Type | McKay's Procedure N=19 | | Turco's Procedure N=17 | |
|---|---|---|---|---|
| | No. | % | No. | % |
| Unilateral | 07 | 36.85 | 07 | 41.18 |
| Bilateral | 06 | 63.15 | 05 | 58.82 |
| Total Foot | 19 | 100.0 | 17 | 100.0 |

Figure 1 displayed the prevalence of clubfoot in families in Groups 1 and 2. In group 1, 23.07% of families had a history of club foot, while in group 2, 33.33% of persons had a history of club foot.

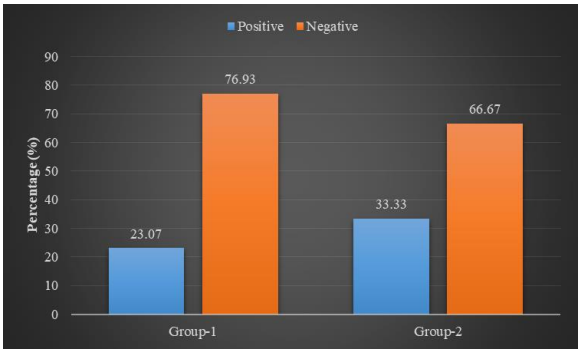


**Figure-1: Bar diagram showing family history of clubfoot in percentage in Group-1 and Group-2**

Figure 2 showed the history of delivery percentage in group 1 and group 2. The breech to have 30.77%, 7.69% caesarean and 61.54% cephalic found in group 1. 41.67% breach, 8.33% caesarean and 50% cephalic found in group 2.

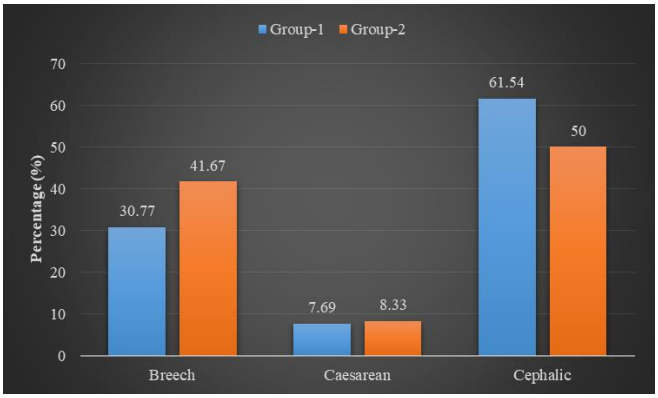


**Figure-2: Bar diagram showing history of delivery in percentage in Group-1 and Group-2**

Figure 3 showed theearly post-operative complications in Group-1 and Group-2. 7.69% blister, 7.69% skin necrosis, 7.69% skin infection were found in group 1 people at early post-operative complications. In group 2 16.66% blister, 7.69% skin necrosis and 7.69% skin infection were found in group 2 people at early post-operative complications.

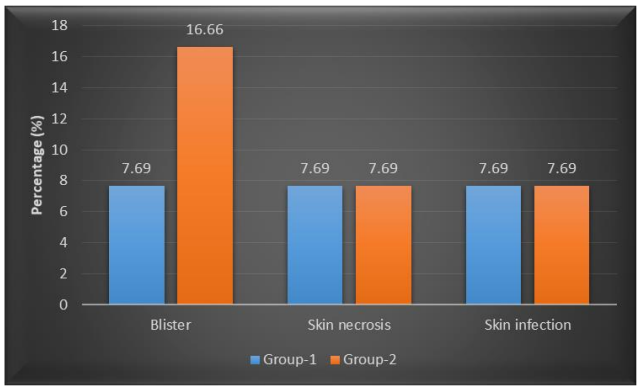


**Figure-3: Bar diagram showing early post-operative complications in Group-1 and Group-2**

Table 4 showed that the patients' distribution by complications (late). Stiffness 01(7.69) of McKay's procedure, deformity 01(7.69) of McKay's procedure, and 01(8.33) of Turco's procedure were performed on these patients. It was not statistically significant since the p value was just 0.893.

**Table 4: Postoperative complications (Late)**

| Complication (late) | McKay's procedure | Turco's procedure | P value |
|---|---|---|---|
| Stiffness | 01(7.69) | 01(8.33) | 0.893 |
| Deformity | 01(7.69) | 02(16.66) | |

**Discussion:**

Out of 25 patients in the current research, 7 individuals (in both Groups I and II) (or 28% of the total) had a positive family history of clubfoot. Out of 25 patients with rigid type clubfoot deformity in the current research, 5 individuals (in both Group-I and Group-II) had additional congenital defects (25%) that were present at birth. One patient in Group I had syndactyly, whereas Group II included one patient with syndactyly and two patients with cleft lip.

In the current research, Group-I had 9 male participants while Group-II contained 8 male participants and 5 female participants. Males made up a total of 17 (68.0%) and females 8 (32.0%). Compared to the studies, there are more male patients (53.4%), (84.62%), and 66.67%).[10]

Seven patients in Group I and seven in Group II had unilateral clubfoot. There were a total of 14 patients (56.6%), in both Groups I and II, and 6 patients in Group I and 5 patients in Group II had bilateral involvement. 11 patients in total (44.0%) from Groups I and II. Bilateral engagement is closer to 46.16% and 42.6% but is greater than 60.0% and 65.38%[11,12]. In this research, 33.33% of patients in Group-I and 30.76% of patients in Group-II are between the ages of 6 and 11 months. The following age range is between 12 and 17 months (23.07% in Group I and 25% in Group II).

Group I got excellent (Excellent + Good) results in 17 feet (89.47%) and unsatisfactory (Fair + Poor) results in 2 feet (10.53%). Excellent results were obtained in 15 feet (78.94%) and good results in 2 feet

(10.52%). Excellent results were attained in Group II's 07 feet (41.18%), while good results were attained in Group II's 02 feet (11.76%). Therefore, excellent results in 02 (Excellent + good) were achieved in 9 feet (52.94%), and unsatisfactory results in 8 feet (47.06%). 55 feet with soft tissue release and an average follow-up of 3 years and 2 months. Results ranged from fair to bad in 18% of instances, and from good to excellent in 82% of cases.[13]

Clubfoot surgery was performed three times at Columbus Children's Hospital between 1981 and 1985, with a 16-month follow-up.[14] By using the Turco, McKay, and Carol procedures, they each produced outcomes that were acceptable in 48%, 62.5%, and 45.8% of the cases.

Early postoperative problems occurred in 3 instances (23.07%) in Group I in the current investigation, including 1 blister (7.69%, case no. 7), 1 skin necrosis (7.69%, case no. 9) and 1 skin infection (7.69%, case no. 11).Early postoperative problems occurred in 4 instances (33.33%) in Group II, including skin necrosis in 1 case (8.33%, case no. 8), blisters in 2 patients (16.66%, case no. 8), and skin infection in 1 case (8.33%, case no. 10). Third generation cephalosporin and dressing administered via a plaster window were used to treat patients who had skin necrosis and infection. In Group I, 2 patients (15.38%) had late problems, including stiffness in 1 patient (7.69%, Case No. 3) and deformity in 1 patient (7.69%, Case No. 5). Three patients in Group II (24.99%) had late problems, including stiffness in one (8.33%, Case No. 4) and deformity in two (16.66%, Case No. 6).

**Conclusion:**

An acknowledged technique of therapy for congenital clubfoot deformity is surgery. This finding suggests that Mckay's approach is a superior form of operation over Turco's procedure. The ultimate function should be considered while creating a treatment plan for recurring and persistent deformity after clubfoot surgery. The objectives of revision surgery are to preserve dynamic muscle balance, achieve a plantigrade pain-free functioning foot, and retain the greatest range of motion possible.

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