Clinical Results of Reconstructive Surgery for Tibial Hemimelia

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All Authors

We have no potential conflicts with this presentation.
Tibial Hemimelii

- Rare disorder; 1/Million
- Absence or hipoplasia of the tibia
- Rigid deformity
- Shortening
- Ankle and knee instability
Tibial Hemimelia

• Autosomal dominant, mostly sporadic
Prenatal diagnosis of unilateral tibial hemimelia


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Key words: PRENATAL DIAGNOSIS, TIBIAL HEMIMELIA, LIMB REDUCTION DEFECTS, ANTENATAL ULTRASOUND, CONGENITAL LIMB DEFECTS
Classification

- Jones (1978)
- Kalamchi and Dawe (1985)
- Henkel (1978)
- Weber (2008)
Jones Klasifikasyonu

- Tip 1a: with hypoplasia of distal femur
- Tip 1b: tibial deficiency, normal femur epiphysis
- Tip II: tibial hypoplasia with intact tibia proximal part
- Tip III: deficiency of proximal tibia with intact distal part
- Tip IV: diastasis of distal part of fibula and tibia with ankle instability
Weber Klasifikasyonu

• Gives more importance to soft tissue problems
• Existing of anlage in form of callus, help to the reconstruction.
• Tip V: hypoplasia of tibia both in proximal and distal
• Tip VI: 2 fibula is present without a tibia

Weber - Classification of Tibial Hemimelia

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New classification and score for tibial hemimelia

Michael Weber
Method

• Last 15 years,
• 26 segments of 19 patients were evaluated
• 7 segments of 5 patients (type 1 and 3 according to Jones classification) were amputated

<table>
<thead>
<tr>
<th>Type</th>
<th>Patient</th>
<th>Segment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1</td>
<td>5</td>
<td>8</td>
</tr>
<tr>
<td>Type 2</td>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>Type 3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Type 4</td>
<td>5</td>
<td>5</td>
</tr>
</tbody>
</table>
Treatment

Deficiency of proximal tibia → Dezarticulation/Amputation

Presence of proximal tibia → Reconstruction with İlizarov techniques
Treatment

- patellar tendon,
- medial and lateral collateral ligament
- cruciate ligament

Proksimal tibia
Ligaments
Quadriiceps function.
Tip 1: Amputation suggestion is not accepted by parents.
Cultural believes?
As there is instability in knee joint she will need a brace to walk.

Amputation is a better option for these patients.

Type 1 patients need to use braces to overcome the knee joint and ankle instability.
Tip 2

15 MOUNTS OF AGE

We choose reconstruction with family
Centralization of calcaneus to distal part of fibula
1) Centralization of calcaneus to fibula distal part

2) Tibialization of distal part of the fibula with foot

After 1 years we see the fibula on x rays
Foot Centralization to distal part of fibula

You should change the hinge during the centralization of the calcaneus to the distal part of fibula

3 dimensional thinking and close follow up is obligatory.
Tibialization of distal fibula
- 6 operation until 6 years old
- 10 months of external fixation
- 4 months of hospitalization
In the second stage; deformity correction and lengthening procedures move on for the plantigrade gait (6 years old)
Lengthening from proximal tibia and correction of equin supination and adductus deformity of the foot (7 months)
Deformity correction from proximal and distal tibia + Lengthening (7 months)
Ş.İ. 11 years old

11 years old
21 months of treatment

16 years old 1 cm of shortening
Outcome parameters

- Mean operation number: 12.1
- Mean duration of external fixator, casting: 27 months
- Walking ability: 8 patients need braces or crutches
Complications

- **62 problems**,
  - Pin tract infection
  - Flexion contracture

- **26 obstacle**
  - Need for fixator revision
  - Regenerate fracture
  - Osteomyelitis

- **16 sequel**
  - Flexion contractures
  - Plastic deformation
  - Knee Dislocation
  - Non reconstructable LLD

5,5 complications/patients

Paley et all.
Outcome parameters

- Mean LLD 7.5 cm
- We have patients that treatment go on
Outcome parameters

Complications:
• 3 knee dislocation
• 1 amputation after the first operations
Results

• In reconstruction group other than type 1 the result of the surgery was satisfactory for patients.
• But in the reconstruction group patients with type 1 tibial hemimelia, results were poor.
• We suggest early amputation for type 1 tibial hemimelia and also for the patients who has been seen for the first time after the age of 5.

Limb Salvage Treatment for Congenital Deficiency of the Tibia

Akifusa Wada, MD, PhD, Toshio Fujii, MD, Kazuyuki Takamura, MD, PhD, Haruhisa Yanagida, MD, Noriko Urano, MD, and Toru Yamaguchi, MD
Discussion

• The treatment modality should be chosen according to the existence of the proximal tibia where stability of the knee joints is present and to the comprehensive contribution of the parents at early age of patients.

• Amputation can be a very good treatment option.