The Nature of Foot Ray Deficiency in Congenital Fibular Deficiency

Bryan Reyes, M.D.
John G. Birch, M.D., FRCS(C)
Mikhail Samchukov, M.D.
Alex Cherkashin, M.D.

Texas Scottish Rite Hospital for Children Dallas, TX

David Hootnick, M.D.

SUNY, Syracuse, NY
Disclosures

Bryan Reyes and David Hootnick:
– None

J. Birch, M. Samchukov, A. Cherkashin:
– Royalties through our employer (TSRH) from Orthofix for a circular fixator (True-lok).
Congenital Fibular Deficiency

• Congenital limb deficiency characterized by partial or complete absence of the fibula with associated anomalies.

• Most common long bone deficiency.
Lateral ray deficiency?
Congenital Fibular Deficiency: A Review of Thirty Years’ Experience at One Institution and a Proposed Classification System Based on Clinical Deformity

John G. Birch, MD, FRCS(C), Todd L. Lincoln, MD, Philip W. Mack, MD, and Craig M. Birch, BSc

Investigation performed at the Texas Scottish Rite Hospital for Children, Dallas, Texas

A review of 104 patients/126 affected extremities treated over a 30-year period

<table>
<thead>
<tr>
<th>Anomaly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upper Extremity</td>
</tr>
<tr>
<td>Ulnar hemimelia</td>
</tr>
<tr>
<td>Amelia</td>
</tr>
<tr>
<td>Syndactyly</td>
</tr>
<tr>
<td>Femur</td>
</tr>
<tr>
<td>Shortening</td>
</tr>
<tr>
<td>Varus or valgus femoral neck</td>
</tr>
<tr>
<td>Acetabular dysplasia</td>
</tr>
<tr>
<td>External rotational deformity (retroversion)</td>
</tr>
<tr>
<td>Hypoplastic lateral condyle</td>
</tr>
<tr>
<td>Knee</td>
</tr>
<tr>
<td>Genu valgum</td>
</tr>
<tr>
<td>Anterior cruciate ligament deficiency</td>
</tr>
<tr>
<td>Ankle</td>
</tr>
<tr>
<td>Ball-and-socket mortise</td>
</tr>
<tr>
<td>Planar mortise</td>
</tr>
<tr>
<td>Valgus deformity</td>
</tr>
<tr>
<td>Instability/dislocation</td>
</tr>
<tr>
<td>Foot</td>
</tr>
<tr>
<td>Tarsal coalition</td>
</tr>
<tr>
<td>Absent lateral rays</td>
</tr>
<tr>
<td>Hypoplasia</td>
</tr>
<tr>
<td>Equinovarus (clubfoot)</td>
</tr>
</tbody>
</table>
THE NATURAL HISTORY AND MANAGEMENT OF CONGENITAL SHORT TIBIA WITH DYSPLASIA OR ABSENCE OF THE FIBULA

A PRELIMINARY REPORT


From the Orthopaedic Department of The Hospital for Sick Children, Great Ormond Street, London

VOL. 59-B, No. 3, AUGUST 1977
Midline Metatarsal Dysplasia Associated with Absent Fibula

David R. Hootnick, M.D.*  E. Mark Levinsohn, M.D.**
and David S. Packard, Jr., Ph.D.†

Clinical Orthopaedics and Related Research
Number 150
July–August, 1980
When less than 5 metatarsals are present, it is frequently stated that the lateral metatarsals are the missing structures.\textsuperscript{1,3,4,13} We have identified 5 patients with congenital absence or shortening of the fibula and dysplasia of midline metatarsals. The midline location of the dysplastic metatarsals in association with fibular deficiency may mean that, in some patients, this entity occurs after the formation of a normal limb model.


Intermediate ray deficiency—a new type of lower limb hypoplasia.

Koczewski P, Shadi M, Kotwicki T, Tomaszewski M, Korbel K

9 patients with fibular deficiency and “intermediate ray deficiency”

Methods

• IRB-approved chart and radiographic review of patients with a diagnosis of congenital fibular deficiency treated at TSRH.

• Diagnosis confirmed by chart/radiograph review.

• Identified patients with adequate xrays for determination of midfoot architecture.
Materials

• Twenty-six patients (28 affected feet) with reduced number of rays and adequate x-rays to assess midfoot architecture identified.
• Evaluated and recorded the number of digits, metatarsals, cuneiforms, and presence/absence of cuboid (or calcaneocuboid coalition).
Results: (28 feet/ 26 patients)

• 21 feet (20 patients) had reduced number of rays, and a clearly developed cuboid or calcaneocuboid coalition
Results: (28 feet/ 26 patients)

- Five feet (5 patients) had similar findings but additional abnormalities:
Results: (28 feet/ 26 patients)

- Five feet (5 patients) had similar findings but additional abnormalities:
  - 3 had postaxial (poly)dactyly
Results: (28 feet/ 26 patients)

- Five feet (5 patients) had similar findings but additional abnormalities:
  - 3 had postaxial (poly)dactyly
  - 1 had Y-shaped 4\textsuperscript{th}/5\textsuperscript{th} metatarsal
Results: (28 feet/ 26 patients)

- Five feet (5 patients) had similar findings but additional abnormalities:
  - 3 had postaxial (poly)dactyly
  - 1 had Y-shaped 4th/5th metatarsal
  - 1 had short, bracket-like 1st metatarsal
• 20/26 of these feet had two or one cuneiform.
Lateral Soft Tissues Exist

Peroneals
Results:

- Two feet (1 patient) had clearly deficient lateral midfoot and metatarsals.
Conclusions

25/26 patients (26/28 feet) with ray reduction and morphologic congenital fibular deficiency in this study demonstrated clear radiographic evidence of lateral midfoot structures.
While the cause of congenital fibular deficiency (and other congenital limb deficiencies) remains elusive, we should not think of congenital fibular deficiency as a “global” lateral limb deficiency.

Conclusions
It ain’t what you don’t know that gets you in trouble, it’s what you know for sure that just ain’t so.
It ain’t what you don’t know that gets you in trouble, it’s what you know for sure that just ain’t so.

Mark Twain
Thank you!