Filum Terminale Division Has Excellent Outcomes, Minimal Complication Risk, and Rare Secondary Re-Tethering

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E-poster #
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Introduction

• Tethered cord syndrome (TCS) is defined by the progressive, often insidious development of neurologic, orthopedic, and/or urologic issues.

• Anatomic abnormality of the filum terminale (FT) is the most common associated finding and, theoretically, the causative factor in children with clinical tethered cord syndrome.

• However, since the presence of anatomic risk factors of the FT potentially resulting in TCS is greater than the actual incidence of tethered cord symptomatology, surgical treatment is controversial.

• To help address this controversy, we reviewed a large, single surgeon, single center experience treating children with division of the FT.
Methods

• **Data:** Single surgeon’s (HSM) consecutive series of patients treated at Rady Children’s Hospital San Diego (2003-2017).

• **Study population:** Patients who underwent spinal cord untethering by division of FT.

• **Study design:** Retrospective chart review.

• **Variables:**
  - **Patients characteristics:** Median age of operation, comorbidities, FT diagnostic variants, presenting symptomatology
  - **Intraoperative complications**
  - **Outcomes:** number improved, stabilized, and retethered
Results: Age of Operation and Comorbidities

• 177 children had 178 procedures for division of FT
  • 98 (55.1%) symptomatic (Symp)
  • 80 (44.9%) asymptomatic (ASymp)

• Median age of operation:
  • 22.5 months (range 3 months to 18.3 years).
  • Symp children were significantly older, 43.5 vs. 11.5 months, p<0.001.

• Comorbidities:
  • 60 (61.3%) Symp and 42 (52.6%) ASymp children had associated comorbidities (VATER, cardiac disease, syndromes of multiple).
Results: Diagnostic Variants

- **Symp**
  - 89 (90.8%) lipoma of FT
  - 7 (7.1%) low conus
  - 1 (1%) low conus/distal syrinx
  - 1 (1%) thickened FT

- **ASymp**
  - 78 (97.5%) lipoma of FT
  - 1 (1.3%) thickened FT/low conus
  - 1 (1.3%) filar cyst/low conus
Results: Presenting Symptomatology

- Of 98 symptomatic patients:
  - 24 (24.5%) neurologic
  - 15 (15.3%) urologic
  - 27 (27.6%) orthopedic
  - 11 (11.2%) neuro and uro
  - 14 (14.3%) neuro and ortho
  - 5 (5.1%) uro and ortho
  - 2 (2.0%) neuro, uro, and ortho
Results: Outcomes

• All patients had intraoperative electrophysiological monitoring.
• One infant (0.6%) experienced intraoperative cardiac instability requiring post-op ICU care. No patient had any procedurally related neurologic complication.
• Of Symp patients, 28 (28.6%) had improvement after untethering, 70 (71.4%) had stabilization of their symptomatology, and none retethered.
• Of ASymp patients, all remained without symptoms except for one patient with VATER diagnosis who had repeat untethering 11 years after initial prophylactic untethering.

<table>
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<tr>
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<th>Operations</th>
<th>Improved</th>
<th>Stabilized</th>
<th>Retethering</th>
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<tbody>
<tr>
<td>Symp</td>
<td>98</td>
<td>28 (28.6%)</td>
<td>70 (71.4%)</td>
<td>0</td>
</tr>
<tr>
<td>ASymp</td>
<td>80</td>
<td>N/A</td>
<td>79 (98.8%)</td>
<td>1 (1.3%)</td>
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Discussion

• Division of the FT reverses or stabilizes tethered cord symptoms in symptomatic children, and prevents symptomatology in at-risk children.

• In this series, there were no associated neurologic complications, minimal (one patient) transient procedurally related comorbidity, and only one patient with symptomatic retethering.

• Division of the FT is a very safe procedure that reliably addresses patients with tethered cord syndrome and should be considered in age appropriate children at risk for tethered cord syndrome.
Summary Points

• 177 children had 178 procedures for division of filum terminale, 55% were symptomatic preoperatively.

• Division of FT reverses or stabilizes symptoms in symptomatic children, and prevents symptomatology in at-risk children.

• In this large series, the procedure for both symptomatic and asymptomatic children had minimal associated complications and only one case of secondary re-tethering.