**Phases In Gap Healing Following Ponseti Type Achilles Tenotomies - An Ultrasonographic Study**

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**Introduction:** In the ponseti technique for correction of club foot, an achilles tenotomy is performed by the clinician, to aid correction of deformity. An artificial tendon gap is created, which eventually heals.

This is in contrast to published data on tendon healing. Here the aim is to reduce the tendon gap to promote healing.

Our aim was to assess the healing pattern of Achilles tendons across the gap created by a percutaneous tenotomy and maintained by cast in club feet.

**Materials and Methods:** 21 tenotomies in 16 patients (Age range 12 weeks-36 months) were monitored with dynamic and static ultrasonographic studies.

Ultrasounds were performed before and immediately after tenotomy and at approximately 3, 6 and 12 weeks post tenotomy.

Cast removal was done at three weeks.

Two patients above age of two were casted for 6 weeks.

**Results:** The healing pattern went through different phases although they were not distinctively exclusive from each other and did show considerable overlap.

First phase showed formation of a bulbous mass with some continuity of scar tissue across tendon gap. The transition zone between new fibre and the original tendon quite distinct. However dynamic ultrasound showed the Achilles tendon moved as a single unit.

Second phase showed fibres resembling normal tendon crossing the gap and reduction of bulbous mass. The transition zone was still discernible.

Final stage demonstrated more homogenous fibres of Achilles tendon with an indistinct transition zone.

Two older children showed a distinctly longer process of healing. One child showed an irregular mass of fluid and soft tissue structures in the gap at six weeks.

The other child demonstrated a relative reduction in the proportion of tendon fibres across the gap.

At 12 weeks there was evidence of continuation of tendon fibres, but transition zone partly visible.

**Discussion:** Our study demonstrates, that when cast immobilisation is discontinued, the tendon is in mid phase of healing.

This may have a positive effect on continued improvement in dorsiflexion while using boots and bars.

It is safe to consider percutaneous tenotomy in children up to 3 years of ages provided the period of immobilisation extended.