

Case Study: Axel

Arthrogryposis, Clubfeet, & Dislocated Hips and Knees
Age: Newborn to 14 months

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BACKGROUND

Abstract

At the time of Axel's birth, it was apparent to both Axel's parents and doctors that there was something very wrong with his legs. His pediatrician had never seen a case like his before. The family hoped to begin treatment immediately and I began treating Axel when he was three days old.

Diagnosis

During the initial examination, I found that Axel had bilateral clubfeet, dislocated knees, and subluxated (partially dislocated) hips. I had seen and treated this many times before and knew that it was a form of arthrogryposis.

TREATMENT

Non-surgical Treatment

Birth to 1 Month

At 5 days of age, Axel's legs were placed in the first of a series of Ponseti clubfoot casts which were also intended to treat his knees. Over the course of the first month of treatment, the correction of Axel's knees had progressed very well. His left knee was in position (located) and his right knee was located and had also achieved a normal range of motion. However, his clubfeet were a bit behind the normal rate of improvement. As a result, he required more casting than a "normal" non-arthrogryptic clubfoot.

1 Month to 2 Months

By 5 weeks of age, Axel's left knee had almost gained a normal degree of movement and his right foot was correcting nicely. Ultrasounds revealed that his left hip was more subluxated than his right. Axel was placed in a Pavlik harness to help hold his hips and legs in proper position while his hip sockets deepened.



2 Months to 3 Months...

Axel's knees and hips had achieved a normal range of motion and ultrasounds at the start of the month showed that both of his hips were located but the sockets remained shallow. His left foot was still not progressing as expected.

Axel was to continue wearing his harness but it could be removed for bathing and short changes of clothing. Due to the severity of his clubfeet, it was determined that he would need to undergo tenotomies at three months.



Surgical Treatment

Achilles Tenotomy

A small horizontal incision was made into Axel's foot and an open tenotomy was performed. Tenotomies are small surgical procedures that involve cutting a tendon to release tension allowing for manipulation and normal movement of the feet.

In many cases, arthrogryptic children may require more than one tenotomy or a minimally invasive posterior (behind the ankle) release to achieve proper correction.

Bilateral Posterior Release Including Ankle and Subtalar Joint & Excision of Tarsal Coalition

Incisions were made into the tendons of Axel's capsule, subtalar, and ankle joints and a cartilaginous bar (an abnormal connection between two bones) was removed which allowed the foot to be manipulated into proper position. The incision was closed in layers and dry sterile bandages were applied before the legs were set in casts.

Results

At 4 months of age, Axel's casts were removed. His feet were well corrected and his knees showed a normal range of motion but there was some mild tightness in the rear of his feet. His use of the harness was discontinued but he was fitted for Mitchell shoes which were to be worn 23 hours per day.

7 Months

By 7 ½ months of age, Axel's hips, knees, and feet were in proper position and functioning normally. He was only wearing his Mitchell bars at night and had begun to sit unassisted.

CONCLUSION

By the age of one, Axel was doing very well. He was standing and holding on independently and had begun walking with assistance. Axel has had an excellent short term result for a severely involved child with arthrogryposis. He will require physical therapy and follow-up during his growing years. He will walk well but there may be times when re-casting or even some surgical correction of rotated (twisted) legs will be needed as he grows. Monitoring and addressing issues in a timely fashion if they arise is crucial for an optimal long-term outcome.



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