

Spica and Spine Casting with Inexpensive Metal Bar

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Introduction

Spica casting is an ancient technique. "Spica" is Latin word "The ear of wheat" and is associated with Virgo, the goddess of the harvest. As a star it is massive and the 14 brightest in the night sky. It is found in spring/summer as the brightest star within the constellation of Virgo. A kernel of wheat has an interwoven protective outer covering. So too does a spica cast cover and protect the injured or deformed child. Spica casting is used in young children for treatment of femur fractures, to maintain a closed hip reduction in DDH, or to protect hip related surgery such as after an open reduction or pelvic or femoral osteotomies. Traditionally a spica cast table is utilized to suspend the child while the cast is applied.

Spine casting in young children has become increasingly popular. Risser described the technique applying a localizer cast that utilizes a 3 point bend with a push (Risser 1976). This technique is assisted by use of a large (Risser) frame that holds the child in place (Fig. 1). Cotrel and Morel described a different technique that utilized the principle of mild elongation through traction with de-rotation of the apex (1964). Even more recently Min Mehta has applied the Cotrel technique to very young children with infantile idiopathic scoliosis with great success in children younger than age 2 years (2005). The technique has been further perfected by D'Astous and Sanders (2007). All of these techniques use a special table that provides axial traction through the head and pelvis, secures the limbs and allows the cast to be applied with 360 access for plaster wrapping and proper placement of molds. Min Mehta has designed a table for very small children that supports the head and upper and lower extremities, but leaves the torso free. Many hospitals in developing countries do not have a spica table for small children. A Mehta spine table or even a Risser table is almost unheard of.



Fig. 1 Risser frame.

Solution

In 2002 the medical team of Project Perfect World began performing pediatric orthopaedic procedures at the Roberto Gilbert Hospital for Children (Fig. 2). Although the hospital was modern and well staffed, there was no small spica table that could be used for children after closed or open hip reductions for DDH or after pelvic and femoral osteotomies. Our Ecuadorian colleagues utilized a wooden bar placed between two tables, but it was too bulky for the smaller children. We found a 4 mm 25 mm piece of aluminum stock (no cost) and cut it at 70 cm length (Figs. 3 & 4 next page). The edges were smoothed with a grinder. The bar is thin enough so that it can be contoured with various amounts of bow to support children from neonates up to about 30 kg in size. Additional upward bow can be placed into the bar to accommodate the heavier child. KY jelly or similar lubricant can be wiped onto the bar so it slides out easily at the completion of the casting.

For routine spica casting the bar is placed between two tables, usually the operating table and a smaller side table of the same height. The child's head and shoulders as well as upper extremities rests on the OR table and a staff member holds the lower limb. The child's torso rests on the bar with complete 360° access to the trunk and pelvis. Be sure to place a folded sheet on the chest and abdomen so that there is enough room to breath in the cast. The sheet and bar are removed at the completion of the casting. The spica cast is then applied as per the surgeon's



Fig. 2 Roberto Gilbert Hospital in Guayaquil, Equador.

usual technique. We recommend posterior splints so that a wooden bar between the lower limbs is not necessary. The mother can thus hold the child close to her without a bar getting in the way.

In 2008 we began performing spinal deformity surgery at the Children's Hospital. Many patients are very young with either a congenital scoliosis or kyphosis. Post operative spine casting has been useful after insitu fusion or hemivertebra resection. We have also found the bar to be very useful to place a Cotrel type of corrective cast in the young child with idiopathic scoliosis. Since the deformity is typically in the thoracic or thoraco-lumbar spine area, we have used the technique described by Dr. John Hall (personal communication) to include one arm in the cast. This prevents the cast from sliding down. The shoulder area can also be one point of a 3 point fulcrum. For a right thoracic curve there is a fulcrum at the apex of the right thoracic ribs with contralateral fulcrum through the left shoulder and left hemipelvis. Head halter traction and traction through the pelvis can easily be added while the cast is being applied. The plaster is molded by hand to provide a well fitting corrective cast. With practice, all of the corrective principles of Mehta can be utilized.

Lesson Learned

A simple and no cost contoured metal bar can be used to apply spica casts or corrective spine casts in young children. This avoids the need to purchase a spica table or to attempt to make a Mehta table. This can be both a temporary fix, and in our program, a permanent solution for applying these casts.

References

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Revised 2/27/10



Fig. 3 Aluminum bar between two tables. Lower illustration shows bar position from above.



Fig. 4 Cast being applied using the metal bar for support.