

Biomechanics and Postoperative Rehabilitation of Pelvic Support Osteotomy for Congenital Hip Dislocation

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ABOUT THE STUDY

Pelvic support osteotomy is a surgical procedure designed to stabilize and support the pelvis, particularly in cases of severe pelvic instability or deformities. This technique is often employed in conditions such as hip dysplasia, pelvic fractures, or certain forms of hip arthritis. The surgery involves cutting and realigning the pelvic bones to achieve better alignment and stability.

The procedure typically starts with an incision over the pelvic region. The surgeon then makes precise cuts in the pelvic bones, often using specialized instruments, to reposition them into a more functional and stable alignment. Once the bones are correctly aligned, they are fixed in place using screws, plates or other fixation devices.

Pelvic support osteotomy can improve mobility, reduce pain and improve the overall function of the pelvis and hips. It is particularly beneficial for patients with structural abnormalities that cannot be effectively managed with non-surgical treatments alone. Post-operative care involves physical therapy and rehabilitation to support recovery and optimize the outcomes of the surgery.

Congenital hip dislocation

Also known as Developmental Dysplasia of the Hip (DDH), is a condition where the hip joint does not form properly in infants and young children. The hip joint is a ball-and-socket joint, where the ball (femoral head) fits snugly into the socket (acetabulum) of the pelvis. In DDH, this fitting is compromised, leading to instability and potential dislocation.

The condition can range from mild dysplasia, where the hip joint is slightly out of alignment, to complete dislocation, where the femoral head is entirely displaced from the acetabulum. The severity of DDH often depends on various factors including the timing of diagnosis and the effectiveness of initial treatments.

Role of pelvic support osteotomy

Pelvic support osteotomy plays a pivotal role in addressing severe cases of congenital hip dislocation, especially when non-surgical methods such as bracing or casting fail to restore proper alignment and stability of the hip joint. The primary goal of this surgical intervention is to realign the hip joint and provide a more stable environment for proper hip function and development.

The procedure involves altering the bony structure of the pelvis to improve the relationship between the femoral head and the acetabulum. This realignment helps in redistributing the forces across the hip joint and improving the congruency between the ball and socket. By achieving a more stable and anatomically correct position, the risk of future dislocations and joint degeneration is significantly reduced.

Biomechanics and surgical goals

Pelvic support osteotomy aims to restore the normal biomechanics of the hip joint. In a properly functioning hip joint, the femoral head should fit snugly into the acetabulum, allowing for smooth and efficient movement. Congenital hip dislocation disrupts this normal alignment, leading to altered biomechanics and potentially causing pain and functional impairment.

The osteotomy procedure addresses these issues by repositioning the acetabulum and femoral head to achieve optimal alignment. This realignment improves the hip joint's ability to bear weight and move correctly, reducing the stress on surrounding structures and promoting normal joint development. The procedure also aims to correct any associated bony deformities that may contribute to the dislocation or instability of the hip joint.

Preoperative considerations

Before performing a pelvic support osteotomy, several preoperative considerations must be addressed to ensure the best possible outcome. These considerations include a thorough assessment of

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the patient's overall health, the severity of the congenital hip dislocation and the presence of any associated conditions that might impact the surgery.

A comprehensive evaluation typically involves imaging studies such as X-rays or Magnetic Resonance Imaging (MRI) scans to assess the extent of hip dislocation and any associated bony abnormalities. These images provide valuable information for planning the surgical approach and determining the most appropriate type of osteotomy.

Additionally, the patient's age and developmental stage are important factors in preoperative planning. Younger patients may require different surgical strategies compared to older children or adults. The overall health of the patient, including any underlying medical conditions, must also be considered to minimize the risk of complications.

Postoperative rehabilitation and management

Effective postoperative rehabilitation is important for achieving the desired outcomes of pelvic support osteotomy. While this

article does not explain specific postoperative care protocols, it is need to recognize the importance of rehabilitation in the recovery process.

Rehabilitation typically involves a combination of physical therapy, controlled exercise and gradual mobilization to restore hip function and strength. The goal of rehabilitation is to ensure that the hip joint heals correctly and that the patient regains full range of motion and strength. A well-structured rehabilitation program helps in minimizing complications, improving joint function and supporting the patient's overall recovery.

Pelvic support osteotomy serves as an important surgical intervention for individuals with severe pelvic instability or deformities, including cases of congenital hip dislocation. This procedure not only stabilizes the pelvis but also restores the alignment and function of the hip joint, significantly improving patient mobility and reducing pain.