Hip issues in children with cerebral palsy – and what are the surgery risks? 9-5-17

Do children with cerebral palsy often have hip issues?

A common hip issue is the knees pulling in towards each other. This can cause scissoring or crossing of the legs. For kids who wear diapers, diaper changes can be difficult due to the tightness.

The knees want to pull in and now the pelvis x-ray shows a hip problem. Why is that?

When the muscles tighten to pull the knees together, they also put pressure on the hip joints. If the muscle tightness is persistent and if it goes on for years, it can slowly work to push the ball of the hip joint out of the socket. This happens so slowly that there is no pain with it. It is a gradual stretching and deforming of the area.

The pelvis x-ray shows mild but definite hip changes. Is surgery a consideration?

You could consider an outpatient surgery, SPML of the hip adductors with obturator nerve blocks. This very low risk surgery decreases the forces on the hip joint. It can keep the hip from getting worse for about a year. It is not a strong enough treatment to reverse the changes.

The pelvis x-ray shows moderate changes. Would SPML be recommended?

SPML alone is too weak of a medicine for this problem. SPML surgery combined with SLOB surgery should be considered.

What is SLOB surgery?
SLOB surgery is for when the ball of the hip is moving out of the socket but is not out yet. SLOB stands for Superior Lateral Outrcopping Bone. Think of the hip joint as a softball in a softball glove. Normally only a little of the ball is out past the fingertips of the glove. Now imagine that the ball has moved so a third to a half of the ball is out of the socket. The SLOB surgery essentially makes the fingertips of the glove longer by adding bone, so that the ball is blocked from moving farther out of the socket.

**What are the advantages of the SLOB surgery over surgeries that cut the femur or thigh bone?**

Faster recovery is the big advantage. The basic structure of the body is not altered like it is when shape of the femur is changed. This means that the body does not have to get used to a different shaped bone. Also the child is allowed to weight bear as soon as tolerated, usually in a month.

**What is involved with SLOB surgery?**

First it is necessary to get a hip brace such as a Maple Leaf Orthosis before the surgery. This brace is then used immediately after the surgery, 24/7. The brace can be loosened so the skin can be kept clean. Following a 5 hour surgery the child will be in the hospital for 4 days with the first day spent in the Pediatric Intensive Care Unit. If flying, fly in Monday and fly out Wednesday 9 days later. If there are complications the stay could be longer.

**Is x-ray followup important following the SLOB surgery?**

X-ray followup is very important following the SLOB surgery. X-rays needed: AP Pelvis at 1, 2, 3, 6, 12, 24 months after the procedure and then yearly while still growing. These can be done during clinic visits with Dr. Yngve or they can be mailed to Dr. Yngve.

The pelvis x-ray shows marked changes and the ball of the hip has gone out of the socket. **Is SLOB surgery a consideration?**
SLOB surgery is too weak a medicine for this problem, the Café Door surgery should be considered. If the ball has moved so it is more than halfway out of the socket, it is called a dislocated hip.

Is a dislocated hip a concern if my child has no hip pain now?

If the cause of the hip dislocation is tight muscles, those muscle forces will likely lead to later hip pain.

Can future hip pain be avoided?

To avoid future pain, the ball can be put back into the socket. The Café Door surgery can do that.

What is done with the Café Door surgery?

The Café Door surgery consists of two parts done as one surgery. The first is to clean out the hip socket so that the ball has space to go back in. The second is to guide the ball back into the socket by cutting and repositioning the upper part of the thigh bone. The unique feature of the Café Door surgery is that the upper part of the thigh bone that includes the ball is placed in a flexed position. This position gently persuades the ball to stay in the socket, so that it can grow in place there.

What are advantages of the Café Door procedure?

A hip brace is used after surgery, a spica cast or body cast is not required. In the brace the knees are slightly spread. The hips are allowed to flex for sitting, and to extend for lying down. Parents are instructed to gently flex and extend the hip to maintain hip range of motion. Standing and taking steps can start in 2 months.
What is involved with Café Door surgery?

First it is necessary to get a hip brace such as a Maple Leaf Orthosis before the surgery. This brace is then used immediately after the surgery, 24/7. The brace can be loosened so the skin can be kept clean. Following a 6 hour surgery the child will be in the hospital for 5 days with the first 2 days spent in the Pediatric Intensive Care Unit. If flying, fly in Monday and fly out Wednesday 9 days later. If there are complications the stay could be longer.

Is x-ray followup important following the Café Door surgery?

X-ray followup is very important following the Café Door surgery. X-rays needed: AP Pelvis at 1, 2, 3, 6, 12, 24 months after the procedure and then yearly while still growing. These can be done during clinic visits with Dr. Yngve or they can be mailed to Dr. Yngve.

Who developed the surgeries discussed here, the SPML surgery, the SLOB surgery and the Café Door surgery?

These surgeries were developed by Roy Nuzzo MD. The SPML surgery about 1985, the SLOB surgery about 1998 and the Café Door surgery about 2012. These surgeries are all variations and modifications of surgeries that have been done since 1935 and before.

Complications following major surgery in children with cerebral palsy

What are typical hospital stays following major surgery in children with cerebral palsy?

A typical time in the hospital following major hip surgery or scoliosis surgery is 5 days. If major complications occur, the stay in the hospital can be 3 weeks or longer.
Is there a way to predict the rate of complications following major hip or spine surgery in children with cerebral palsy?

SPML surgery is minor surgery with a very low complication risk. The risks following scoliosis surgery, which is a major surgery, have been well studied (reference attached). The risks of SLOB surgery and Café Door surgery could be similar, particularly if surgery is done on both sides at the same time. The information below applies to scoliosis surgery, but it is a good guide also for hip surgery.

What are the risks?

Non-ambulatory children (GMFCS 5) with cerebral palsy are at increased risk of major complications. Those risks are greater if they have any of the following conditions:

- Seizure disorder
- Non-verbal
- Gastrostomy tube
- Tracheotomy

If they have none of the above conditions (GMFCS 5.0) then their risk is 12%
If they have one of the above conditions (GMFCS 5.1) then their risk is 21%
If they have two of the above conditions (GMFCS 5.2) then their risk is 31%
If they have three of the above conditions (GMFCS 5.3) then their risk is 49%

What do major complications include?

Major complication include the following:

- **Respiratory**: placement of a chest tube, intubation for longer than 2 days, reintubation, placement of a new trach tube, pulmonary edema, ARDS
- **Heart**: perioperative cardiac arrest
- **Gastrointestinal**: perioperative or postoperative abdominal surgery, placement of a new G tube, liver failure.
- **Neurological**: motor deficits or paralysis following spine surgery.
- **Infections**: deep wound infection.
- **Blood clots**: deep venous thrombosis, pulmonary embolism.
Death

What are strategies for decreasing major surgery risk?

2. Consider major hip surgery on one hip instead of both hips.
3. Instead of major hip surgery consider minimally invasive SPML surgery which can include hip adductor release, obturator nerve block and hip joint injection. SPML surgery is extremely low risk, with a major complication rate of about 0.1% (one in a thousand). With this approach it might be necessary in the future to remove some bone from the upper part of the thigh bone to make space and to take away pressure.

Reference:


Subclassification of GMFCS Level-5 Cerebral Palsy as a Predictor of Complications and Health-Related Quality of Life After Spinal Arthrodesis.


BACKGROUND: The Gross Motor Function Classification System (GMFCS) of cerebral palsy categorizes patients by mobility. Patients at GMFCS level 5 are considered the most disabled and at high risk of hip and spine problems, yet they represent a wide spectrum of function. Our aim was to subclassify patients at GMFCS level 5 who underwent spinal arthrodesis on the basis of central neuromotor impairments and to assess whether subclassification predicted postoperative complications and changes in health-related quality of life.

METHODS: Using a prospective cerebral palsy registry, we identified 199 patients at GMFCS level 5 who underwent spinal arthrodesis from 2008 to 2013. Patients were assigned to subgroups according to preoperative central neuromotor impairments: the presence of a gastrostomy tube, a tracheostomy, history of seizures, and nonverbal status. Nine percent of patients had 0 impairments (GMFCS level 5.0), 14% had 1 impairment (level 5.1), 26% had 2 impairments (level 5.2), and 51% had 3 or 4 impairments (level 5.3). The Caregiver Priorities and Child Health Index of Life with Disabilities (CPCHILD) questionnaire was used for preoperative and postoperative health-related quality-of-life outcome assessments, and major complications were recorded.

RESULTS: The rate of major complications increased significantly with higher GMFCS level-5 subtype (p = 0.002), with 12% at level 5.0, 21% at level 5.1, 31% at level 5.2, and 49% at level 5.3. Five of the 7 patients who died within the follow-up period were at level 5.3. No significant differences were found among subgroups with respect to the magnitude of correction of the major coronal curve or pelvic obliquity. Preoperative and final follow-up CPCHILD total scores decreased significantly from GMFCS level 5.0 to level 5.3. However, no significant differences were found by subgroup with respect to the magnitude of improvement in CPCHILD total scores from the preoperative to the final follow-up evaluation (p = 0.597).
CONCLUSIONS: Stratification based on central neuromotor impairments can help to identify patients with cerebral palsy at GMFCS level 5 who are at higher risk for developing complications after spinal arthrodesis.

LEVEL OF EVIDENCE: Prognostic Level III. See Instructions for Authors for a complete description of levels of evidence.