Gastrostomy Tubes in Patients With Cerebral Palsy Undergoing Surgery—Usually an Ally, but the Devil Is In the Details

David I. Rappaport, MD and Emily K. Fingado, MD

General Academic Pediatrics/Hospital Medicine, Nemours/A.I. duPont Hospital for Children, Wilmington, DE


David I. Rappaport, MD and Emily K. Fingado, MD

Drs. Rappaport and Fingado are Pediatric Hospitalists/Complex Care Pediatricians at Nemours A.I. duPont Hospital for Children. They partner with the Division of Cerebral Palsy/Department of Orthopedic Surgery to provide perioperative co-management of patients with CP undergoing orthopaedic surgery at duPont.

In this issue of JPOSNA, Dr. Shiver et al. review data about the role of an enterostomy feeding tube (gastrostomy/G-tube, jejunostomy/J-tube, or gastro-jejunostomy/G-J tube) in patients with cerebral palsy undergoing spinal surgery for neuromuscular scoliosis.[1] The authors quite rightly comment that spinal surgery in these patients represents a significant intervention that may result in a number of respiratory, gastrointestinal, and infectious complications. These complications can have a tremendous medical, social, and psychological impact on the patient and the patient's family, so understanding a particular patient's risk factors before surgery is an important part of preoperative planning. As pediatric hospitalists who often co-manage these patients at our institution—including seeing these patients preoperatively with an emphasis on their nutritional status[2]—we greatly appreciate the opportunity to comment on this paper.

Dr. Shiver et al. note that several studies have indicated that the presence of an enterostomy tube may represent an independent risk factor for postoperative complications in patients with CP undergoing scoliosis surgery. In one study that included children at seven hospitals, the authors noted that the presence of a G-tube or GJ-tube was noted to be an independent risk factor for postoperative surgical site infection (odds ratio of 3.45)—a stronger risk factor than even surgical factors such as long operating times or large curve magnitude.[3] Another study found the presence of a G-tube increased the risk of postoperative pancreatitis by 61%.[4] In addition, as Shiver et al. note, the presence of a G-tube in a nonambulatory child may increase the risk for obesity which in itself may lead to respiratory complications and poor wound healing.

We agree with Dr. Shiver et al. in urging caution in interpreting these data, however. An important aspect of understanding surgical risk factors for an individual patient is understanding that patient's individual history and physiology, not simply whether the patient has an enterostomy tube. For patients with an enterostomy tube, these important details may include three important questions:

1. What was the indication for the placement of the patient's tube (aspiration risk/respiratory safety vs. inadequate intake vs. both)?

2. What type of tube (gastrostomy vs. gastrojejunostomy vs. jejunostomy) does the patient have and why?

3. Does the patient take any feeds orally in addition to those via tube?

These questions offer significantly richer data than simply whether a patient has a gastrostomy tube and may be critical in assessing postoperative risk factors. For example, a patient who is known to aspirate all consistencies of foods, has a tracheostomy due to salivary aspiration, and requires a gastrojejunostomy for poor gastric motility after failing a traditional gastrostomy tube is in our opinion fundamentally medically different than one who eats most feeds by mouth but requires additional calories through the tube. Orthopaedic studies have typically not explored the indication for tube placement, type of tube, or whether the patient also takes feeds by mouth; this is in our opinion a limitation to the original data. In our experience, patients with enterostomy tubes placed for aspiration prevention/respiratory safety and those who take nothing by mouth are at higher risk for postoperative complications than their counterparts. Future data will confirm or refute this assessment.

From a practical perspective, the presence of an enterostomy tube is a great help for us as pediatric hospitalists collaborating with our pediatric orthopaedic colleagues. When we see patients with cerebral palsy in anticipation of spinal fusion surgery, we often do so in conjunction with nutrition staff to ensure optimum wound healing after surgery. A G-tube allows us to potentially increase caloric intake for the patient but also definitively control how many calories the patient is receiving. Increasing calories in patients without enterostomy tubes can often be difficult, or depending on the patient's temperament, sometimes impossible. Postoperatively, the presence of an enterostomy often allows starting enteral feeds sooner—even when the child may not be alert or hungry enough to eat much orally—which may help reduce complication rates.[5,6]

When evaluating risk factors for postoperative complications in surgery for neuromuscular scoliosis in patients with cerebral palsy, the devil is in the details. The presence of an enterostomy tube is an important consideration—but so is the rest of the patient.[7] There is no good replacement for a comprehensive evaluation of the patient's medical history, with particular attention to respiratory, gastrointestinal, and nutritional aspects. We appreciate the opportunity to contribute to this global assessment as we collaborate with our pediatric orthopaedic colleagues to reduce risks of this important surgery—one patient a time.

References

1. Shiver AL, Shaw KA, Murphy JS, and Fletcher ND. Current Concept Review: Gastrostomy Tubes in Children with Non-Ambulatory Cerebral Palsy and Neuromuscular Scoliosis: An Enemy or An Ally? *JPOSNA* Vol. 3, No. 2

2. Rappaport DI, Cerra S, Hossain J, Sharif I, Pressel DM. Pediatric hospitalist preoperative evaluation of children with neuromuscular scoliosis. J Hosp Med. 2013 Dec;8(12):684–8.

3. Sponseller PD, Jain A, Shah SA, Samdani A, Yaszay B, Newton PO, et al. Deep wound infections after spinal fusion in children with cerebral palsy: a prospective cohort study. Spine (Phila Pa 1976). 2013 Nov 1;38(23):2023–7.

4. Abousamra O, Nishnianidze T, Rogers KJ, Er MS, Sees JP, Dabney KW, et al. Risk factors for pancreatitis after posterior spinal fusion in children with cerebral palsy. J Pediatr Orthop B. 2016 Aug 6

5. Verhofste BP, Berry JG, Miller PE, Crofton CN, Garrity BM, Fletcher ND, et al. Risk factors for gastrointestinal complications after spinal fusion in children with cerebral palsy. Spine Deform. 2021 Mar;9(2):567–78.

6. Bellaire LL, Bruce RW, Ward LA, Bowman CA, Fletcher ND. Use of an Accelerated Discharge Pathway in Patients With Severe Cerebral Palsy Undergoing Posterior Spinal Fusion for Neuromuscular Scoliosis. Spine Deform. 2019 Sep;7(5):804–11.

7. Jain A, Sponseller PD, Shah SA, Samdani A, Cahill PJ, Yaszay B, et al. Subclassification of GMFCS Level-5 Cerebral Palsy as a Predictor of Complications and Health-Related Quality of Life After Spinal Arthrodesis. J Bone Joint Surg Am. 2016 Nov 2;98(21):1821–8.