To Tie or Not to Tie: The Dilemma of the Supernumerary Digit

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An 11-day-old African American boy was brought in for a well-baby visit. Pregnancy, labor, and delivery had been uncomplicated. He had bilateral ulnar supernumerary digits, which had been suture-ligated on day 2 of life. The digits had autoamputated, but necrotic stumps remained. His mother stated that he was irritable and cried whenever these remnants were touched. The necrotic stumps were removed in the office, under local anesthesia, with a scalpel.

Polydactyly—the presence of an extra finger or toe—is a common minor malformation. The frequency of polydactyly in African Americans is 13.9 per 1000 births; this is 9 times the frequency seen in US whites. Postaxial polydactyly (also called ulnar polydactyly) is the most common type and refers to duplication of the little finger. In type A postaxial polydactyly, the extra digit is fully developed. In type B postaxial polydactyly, the extra digit is rudimentary and pedunculated (Figure).²

The usual method of treating type B postaxial polydactyly in the newborn is suture ligation at the base of the pedicle, which produces necrosis and autoamputation. The most recent editions of 2 standard pediatric textbooks advise this approach.³,⁴ However, several treatment options are available for a neonate in whom type B postaxial polydactyly is discovered. These include:

• No treatment (which is not really an option).
• Suture ligation.
• The use of local anesthesia and simple excision with scalpel or scissors.
• Surgical division of the pedicle with attentive transection of the accessory digital nerve branches, followed by skin closure.

The Downside of Suture Ligation
Although suture ligation is simple to perform, it does have the potential for complications. Frieden and colleagues describe an infected ligated supernumerary digit, and one report mentions a necrosed digit that remained attached a month after ligation. A residual bump at the site of ligation was found in 43% of patients examined at an average of 20 months of age. Another possible complication of suture ligation is the development of an amputation neuroma at the ligation site. Leber and Gosain describe the operative and histological findings of neuroma in 3 children who had 5 supernumerary digits ligated. Two of the patients presented with pain at the neuroma site. When the authors examined the parents and grandparents of children referred for treatment of supernumerary digits, they found at least 8 adults with sequelae of digit ligation. These adults, and an additional adult in another report, had at least 1 of the following in the vestigial remnant:

"discomfort on pressing or hitting the remnant, . . . tingling, . . . and intermittent bleeding or ulceration." Leber and Gosain thus conclude that the true incidence of neuroma formation following suture ligation of pedunculated supernumerary digits in infancy may be much higher than previously thought. Amputation neuromas arise, according to Leber and Gosain, because ligation does not properly treat the digital nerve that is always present in the supernumerary digit. The authors explain why ligation predisposes to neuroma formation: "When nerve tissue is cut the Schwann cell-endoneural barrier is disrupted, allowing the axons to regenerate in a disorganized fashion. The regenerating axons are often surrounded by connective tissue, further disorganizing the regenerate. If a nerve lies too near the end of the stump . . . it is subject to repeated trauma from pressure, [and] friction. . . . This leads to increased edema and fibrosis of the nerve, leading to increased sensitivity." Thus, to prevent the development of amputation neuromas, one must avoid cutting or ligating a nerve at skin level.

But What Type of Surgical Excision?
Leber and Gosain prefer the last of the above options: they recommend dissecting the nerve free from the surrounding tissue before transection and then placing traction on the nerve while transection is performed. They note that this method allows the nerve to retract into a bed of healthy soft tissue away from the surface of the amputated stump. In fact, they consider simple excision to have as much potential for complication as does ligation.

Growing Support for Surgical Excision Opinions
on the question of ligation versus surgical excision do appear to be shifting. A survey of 149 pediatricians and neonatologists in the United Kingdom revealed that 79% would refer a child with type B postaxial polydactyly to a hand surgeon, 15% would ligate, and 5% would use excision. We found 3 articles recommending primary surgical excision, as well as a similar statement in the recent (2009) American Academy of Pediatrics' textbook, Pediatric Primary Care. Another article advises caution in using ligation because of a "high rate of complications" (even though the complications referred to were most likely cosmetic). Frieden and colleagues advise using local anesthetic and iris scissors. Still, the only prospective study on the subject recommends suture ligation.

Our View
We consider necrosis a poorly controllable surgical instrument. We cannot prove the superiority of local anesthetic and scalpel excision, but while we wait for a trial comparing treatment techniques, we suggest that clinicians use the latter approach. This obviates the need to perform the procedure in the operating room while eliminating the risk of infection that is always associated with tissue necrosis.

References: REFERENCES:

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