

Complications in Surgery for Brachial Plexus Birth Injury: Avoidance and Treatment

John A. I. Grossman, MD,*† Andrew Price, MD,*†
Harvey Chim, MD*‡



CME INFORMATION AND DISCLOSURES

The *Journal of Hand Surgery* will contain at least 2 clinically relevant articles selected by the editor to be offered for CME in each issue. For CME credit, the participant must read the articles in print or online and correctly answer all related questions through an online examination. The questions on the test are designed to make the reader think and will occasionally require the reader to go back and scrutinize the article for details.

The JHS CME Activity fee of \$15.00 includes the exam questions/answers only and does not include access to the JHS articles referenced.

Statement of Need: This CME activity was developed by the JHS editors as a convenient education tool to help increase or affirm reader's knowledge. The overall goal of the activity is for participants to evaluate the appropriateness of clinical data and apply it to their practice and the provision of patient care.

Accreditation: The ASSH is accredited by the Accreditation Council for Continuing Medical Education to provide continuing medical education for physicians.

AMA PRA Credit Designation: The American Society for Surgery of the Hand designates this Journal-Based CME activity for a maximum of 1.00 AMA PRA Category 1 Credits™. Physicians should claim only the credit commensurate with the extent of their participation in the activity.

ASSH Disclaimer: The material presented in this CME activity is made available by the ASSH for educational purposes only. This material is not intended to represent the only methods or the best procedures appropriate for the medical situation(s) discussed, but rather it is intended to present an approach, view, statement, or opinion of the authors that may be helpful, or of interest, to other practitioners. Examinees agree to participate in this medical education activity, sponsored by the ASSH, with full knowledge and awareness that they waive any claim they may have against the ASSH for reliance on any information presented. The approval of the US Food and Drug Administration is required for procedures and drugs that are considered experimental. Instrumentation systems discussed or reviewed during this educational activity may not yet have received FDA approval.

Provider Information can be found at <http://www.assh.org/Pages/ContactUs.aspx>.

Technical Requirements for the Online Examination can be found at <http://jhandsurg.org/cme/home>.

Privacy Policy can be found at <http://www.assh.org/pages/ASSHPrivacyPolicy.aspx>.

ASSH Disclosure Policy: As a provider accredited by the ACCME, the ASSH must ensure balance, independence, objectivity, and scientific rigor in all its activities.

Disclosures for this Article

Editors

David T. Netscher, MD, has no relevant conflicts of interest to disclose.

Authors

All authors of this journal-based CME activity have no relevant conflicts of interest to disclose. In the printed or PDF version of this article, author affiliations can be found at the bottom of the first page.

Planners

David T. Netscher, MD, has no relevant conflicts of interest to disclose. The editorial and education staff involved with this journal-based CME activity has no relevant conflicts of interest to disclose.

Learning Objectives

Upon completion of this CME activity, the learner should achieve an understanding of:

- Recognition of potential complications that may arise from the diagnosis and treatment of birth brachial plexus injuries
- Avoidance of potential treatment complications
- Treatment of complications that may arise from surgery for birth brachial plexus injuries

Deadline: Each examination purchased in 2018 must be completed by January 31, 2019, to be eligible for CME. A certificate will be issued upon completion of the activity. Estimated time to complete each JHS CME activity is up to one hour.

Copyright © 2018 by the American Society for Surgery of the Hand. All rights reserved.

Brachial plexus birth injuries are rare, with treatment and follow-up often required from infancy until skeletal maturity. We review complications that may occur related to primary nerve surgery or secondary musculoskeletal procedures, and discuss how these may be avoided. (*J Hand Surg Am.* 2018;43(2):164–172. Copyright © 2018 by the American Society for Surgery of the Hand. All rights reserved.)

From the *Brachial Plexus Program, Nicklaus Children's Hospital, Miami, FL; the †Department of Orthopedic Surgery, NYU Hospital for Joint Diseases, New York, NY; and the ‡Division of Plastic and Reconstructive Surgery, University of Florida College of Medicine, Gainesville, FL.

Received for publication April 5, 2017; accepted in revised form November 14, 2017.

No benefits in any form have been received or will be received related directly or indirectly to the subject of this article.

Corresponding author: Harvey Chim, MD, Division of Plastic and Reconstructive Surgery, University of Florida College of Medicine, 1600 SW Archer Rd, PO Box 100138, Gainesville, FL 32610; e-mail: harveychim@yahoo.com.

0363-5023/18/4302-0008\$36.00/0
<https://doi.org/10.1016/j.jhsa.2017.11.008>

Key words Brachial plexus birth injury, obstetric brachial plexus injury, complications of surgery.



BECAUSE OF THEIR RARITY, BRACHIAL plexus birth injuries (BPBIs) are not commonly encountered. The evolution of early primary nerve surgery and late reconstruction of deformities of the shoulder and elbow has led to improved outcomes. Most publications deal with outcomes; few have focused on potential complications encountered at various stages of treatment and techniques to avoid or manage a poor or unfavorable result.^{1–4} We will review possible complications at each of the different phases of treatment and suggest how to avoid or treat these.

COMPLICATIONS ARISING OUT OF INCOMPLETE OR INACCURATE DIAGNOSIS

Affected infants are first noticed by decreased or absent movement of an upper extremity at birth. They are then seen by a child neurologist and often referred to a brachial plexus surgeon for further evaluation and management. It is essential to obtain a full history to diagnose other neurologic problems and to rule out any other associated congenital lesions. A detailed initial physical examination should determine (1) the severity of the injury as determined by the Narakas classification and (2) the condition of the involved shoulder and elbow—for the presence of an acute fracture or dislocation. Infants with BPBI are classified by the Narakas classification into 5 groups: (1) upper Erb's palsy (C5–C6); (2) extended Erb's palsy (C5–C7); (3) total palsy with no Horner's sign; (4) total palsy with temporary Horner's sign; and (5) total palsy with Horner's sign^{5,6} (Table 1).

It is common in the Narakas Grade 1 and 2 (upper and middle plexus) lesions to find early (within 1–2 mo of age) evidence of tightness to passive external rotation or even the presence of an internal rotation contracture of the shoulder combined with limitation in active elevation. In addition, traumatic shoulder or elbow dislocations can occur and may be missed. Early shoulder contracture with impending dislocation can be managed with botulinum toxin injection into the internal rotator muscles and casting (Video A, available on the *Journal's* Web site at www.jhandsurg.org).⁷ However, a severe internal rotation contracture may require surgical release. This can be prevented, and it is important that the tendency for an

internal rotation contracture be addressed early in conjunction with the treating therapist preferably using the Vancouver supination—external rotation orthosis (Sup-ER)⁸ during sleeping coupled with gentle stretching.

If a trial of nonoperative treatment and splinting is not unsuccessful, a follow-up examination will show tightness with passive external rotation and possibly co-contraction of some muscles. The surgeon should have a low threshold for proceeding to an early examination of the glenohumeral joint under sedation and injection of botulinum toxin into the internal rotators and adductors of the shoulder including the pectoralis major, latissimus dorsi/teres major, and subscapularis. Botulinum toxin injection is performed using a Teflon-coated needle and with direct muscle stimulation. Our research has shown that an experienced surgeon will miss the target muscle in more than 20% of cases if not using this technique and thus will not achieve the desired effect.⁹

Sometimes one encounters an infant below 6 months of age with a very tight internal rotation contracture. In these patients, we proceed with ultrasonography or preferably magnetic resonance imaging (MRI) (Video B, available on the *Journal's* Web site at www.jhandsurg.org), examination under sedation, and if we are able to obtain passive reduction of the posteriorly subluxated glenohumeral joint with stability, we inject botulinum toxin followed by a shoulder spica cast for 3 weeks. In these cases, it is critical to obtain full passive external rotation of the shoulder. Otherwise, a subscapularis slide operation will be required. Depending on age, plexus exploration, neurolysis and repair with nerve transfers, and/or grafts are performed simultaneously. This often also prevents worsening of the shoulder deformity.

COMPLICATIONS WITH PRIMARY NERVE SURGERY

Preoperative considerations

An accurate and detailed preoperative evaluation aids in the avoidance of certain surgical complications.^{3,10} Relevant issues on history include recent respiratory illness in the patient and family respiratory illness. In our study of 100 consecutive cases with a focus on

Download English Version:

<https://daneshyari.com/en/article/8800046>

Download Persian Version:

<https://daneshyari.com/article/8800046>

[Daneshyari.com](https://daneshyari.com)