

Medical management of displaced mid-shaft clavicle fractures

Between 2010 and 2014 WorkSafeBC accepted 231 clavicle fracture claims, which resulted in claims costs of \$13.7 million. Close to \$8 million worth of those claims represented short-term disability costs. The majority of people suffered fractures from falls, motor vehicle incidents, or being struck by objects.

Conservative versus surgical treatment

Historically, mid-shaft clavicle fractures were treated conservatively with benign neglect because surgical management was considered fraught with complications and poor outcomes. Only rare open fractures or ones with risk of skin compromise were treated surgically. Patients initially treated with benign neglect returned for follow-up treatment only on those infrequent occasions when a clear non-union of the fracture developed.^{1,2}

In 2000 surgeons began to question whether benign neglect was, in fact, the best treatment for fractures that commonly had displacement and shortening and, when healed, left cosmetic and potentially functional deformities. For young, active males, who are the most likely to experience mid-shaft clavicle fractures, surgical osteosynthesis could potentially achieve the desired rapid return to function and early union, while minimizing nonunion and symptomatic mal-union.³

Prospective studies of conservative management of mid-shaft clavicle fractures revealed the following:

- Nonunion rates of between 15% and 20%.

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- Objective shoulder strength loss between 18% and 33%.
- Residual sequelae at 6 months postinjury of 42%.

All these numbers were higher than originally thought.⁴⁻⁶ Theoretically, since the position of the scapula becomes more protracted with a

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mal-united and shortened clavicle, re-establishing the length of the clavicle would have a similar impact on function as restoring the length of a distal radius in the setting of a shortened distal radius fracture.

Meta-analyses: Discordant results

Since 2000 researchers have conducted many randomized clinical trials comparing surgical and conservative management, the goal being to determine the most appropriate treatment for displaced mid-shaft clavicle fractures. Discordant results led to meta-analyses and systematic reviews in an attempt to combine the data to establish the superior treatment method.^{3,7-11} The six meta-analyses included 11 studies published between 2000 and 2013.¹²⁻²²

Unfortunately, the meta-analyses came to discordant conclusions. Some suggested surgical management was

superior; others favored conservative management. Consequently, authors of the most recently published systematic review of the meta-analyses used the Jadad decision algorithm²³ and concluded that the highest quality review was the Cochrane review published by Lenza and colleagues in 2013.⁸ This review concluded that “Limited evidence is available from randomized controlled trials on the relative effectiveness of surgical versus conservative treatment for acute middle third clavicle fractures. Treatment options must be chosen on an individual patient basis, after careful consideration of the relative benefits and harms of each intervention and of patient preferences.”

Lenza and colleagues found that surgical intervention was superior to conservative treatment in DASH score, constant score, symptomatic mal-union, overall treatment failure, deformity and asymmetry, asymptomatic mal-union, stiffness/restricted range of shoulder movement, number of patients returning to sport activities, and time to return to previous activities. There were no differences in function, UCLA score, pain, symptomatic nonunion, early mechanical failure, unsightly scar, total cosmetic problems, asymptomatic nonunion, skin and nerve problems (incisional numbness), refracture, and total adverse events. Conservative treatment was superior in hardware irritation and prominence, infection and dehiscence, and hardware irritation requiring removal.

With no clear answer on the benefits of surgical management you should discuss the risks and benefits of each type of management with each patient and tailor the management based on each individual’s expectations and acceptance of risk.

Personal experience

As a subspecialty shoulder surgeon in clinical practice, I have seen consistently good outcomes with surgical management, with low rate of hardware irritation and need for hardware removal. While my results are anecdotal, newer second-generation clavicle plating systems are lower profile than first-generation systems. When combined with careful surgical technique, the need for secondary surgery for plate removal is low. Further studies are required to evaluate whether second-generation systems demonstrate reduced rates of secondary surgery for removal.

In my own clinical practice I have found that surgical management of displaced mid-shaft clavicle fractures results in more rapid return to activity and function with high patient satisfaction. Because of this experience, and after reviewing the risks and benefits of both surgical and conservative management with each patient, I continue to choose surgical stabilization to manage the majority of displaced mid-shaft clavicle fractures, particularly in young, active patients.

More information and assistance

If you would like further information or assistance in choosing the appropriate treatment strategy for a worker patient with a displaced mid-shaft clavicle fracture, please contact a medical advisor in your nearest WorkSafeBC office.

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References

Available at bcmj.org.

Dr Alice P. “Teddy” Suiker, 1927–2014



Dr Suiker’s travel-filled life began at an early age. The year after Alice was born in Rotterdam, Netherlands, the Suiker family im-

migrated to Canada on the RMS *Alaunia*, arriving in Quebec and traveling by train to Vancouver. The household expanded to include six lively younger sisters and one brother. With hard work and plenty of fun and adventure, Alice completed high school and then her BSc degree through the University of British Columbia and Brigham Young University. She then joined the bone metabolism laboratory of physiologist Dr Harold Copps, who astutely recognized Alice’s abilities and potential and encouraged her to enter the UBC Faculty of Medicine in 1957.

Dr Suiker’s career in family medicine took her to Kitimat, where she met the love of her life, Matt Gooding, and inherited 3 children and eventually enjoyed 30 nieces and nephews. Moves then occurred to St. Lawrence, Newfoundland, and later to Montreal, where Dr Suiker became an assistant professor at the McGill Faculty of Medicine. In 1977 the family moved to Tsetis Island, BC, and Alice joined the Cowichan medical community as its first female practitioner. For the last 15 years of her career, Dr Suiker served in Native and remote settlements in Fort Nelson, Slokan, Dease Lake, Barriere, and Mistissini on James Bay, finally retiring in 2012 at the age of 85 years.

Although she was a deeply private person, Alice always revealed her cheerful, positive demeanor. A loyal and supportive colleague, she offered her patients exemplary care and brought an infectious sense of enthusiasm to her profession. As one of her close friends stated, “I think she really loved being a doctor.” She was known for her hugs and greetings of “Hi-ya, Hon!” Indeed, she had a wonderful, generous character.

Thirty years ago, in the era when the Union Club in Victoria was an all-male bastion, a few male physician buddies (of questionable reputation) secreted Alice into the Great Snooker Room where, after a few games and refreshments, it was decided that it would be remiss to not record the historic occasion, so Alice printed the words “ALICE WAS HERE” on one of the old English oak support timbers in pink cue chalk. We are told that it remains to this day.

—Donald R. Hilton, MD, FRCPC
Chemainus

Recently deceased physicians

If a BC physician you knew well is recently deceased, consider submitting a piece for our “In Memoriam” section in the *BCMJ*. Include the deceased’s dates of birth and death, full name and the name the deceased was best known by, key hospital and professional affiliations, relevant biographical data, and a high-resolution photo. Please limit your submission to a maximum of 500 words. Send the content and photo by e-mail to journal@doctorsofbc.ca.