

Chronic, Congenital Bell's Palsy – Anatomic Variations of the Facial Nerve and Surrounding Features



Jonathan W. Holland^{1*}, OMS-III, BSN, Blake A. Dickenson^{1*}, OMS-III, BS, Edie Sperling², PT, DPT, OCS, CMPT
¹Western University of Health Sciences COMP-Northwest, Lebanon, OR

²Department of Medical Anatomical Sciences, Western University of Health Sciences COMP-Northwest, Lebanon, OR

*Equally contributing authors

OBJECTIVE

The purpose of the study was to investigate the anatomical abnormalities associated with the facial nerves in a living patient with chronic, congenital right-sided Bell's Palsy, of unique variation, secondary to *in utero* motor vehicle trauma.

INTRODUCTION

Bell's Palsy is a form of paralysis affecting the facial (7th cranial) nerve. It is thought to be caused by swelling and compression of the nerve resulting in unilateral facial drooping, tearing, drooling, and difficulty closing the eyelid on the affected side. It is commonly associated with viral etiologies. Most cases are acute and resolve either spontaneously or with antiviral and steroid therapy. Cases of chronic Bell's Palsy are rare, limited primarily to patients with a history of severe facial trauma.

STUDY DESIGN

The extra-cranial aspect of the facial nerve was scanned bilaterally using ultrasound along the Transverse axis as it exited the stylomastoid foramen using a linear 13-MHz probe. The diameter was measured at the nerve's thickest region. Literature review reports a mean facial nerve diameters to be 0.8 ± 0.2 mm at this location

RESULTS

Utilizing US imaging, we identified the Right and Left Facial nerves of the patient. The facial nerve appeared as a thin, tubular, hyperechoic-rimmed structure, triangulated utilizing the styloid process, mastoid process, and external acoustic meatus. The Left, unaffected, facial nerve diameter was determined to be 1.2 mm; while the Right, affected, facial nerve diameter was determined to be 1.05 mm.

Left Facial Nerve



Right Facial Nerve



DISCUSSION

Using ultrasound, we were able to visualize and image the facial nerve to compare measured diameters on both sides. It is worth noting the patient has incomplete loss of function of CN7 on the affected side with retained function of right palpebral part of Orbicularis Oculi, risorius, buccinator, and Orbicularis Oris mm. Despite this functional retention, it is interesting to note that the left-side facial nerve exhibits an increased diameter compared to the contralateral side and the accepted literature.

CONCLUSION

We found that the affected facial nerve had a 12.5% reduction in diameter compared to the unaffected side. An increased size of the unaffected facial nerve from the literature-reviewed mean also accompanies the stark contrast in facial asymmetry. These findings suggest that chronic, congenital CN7 nerve atrophy may lead to contralateral hypertrophy of the unaffected nerve.

This study was limited by the challenging nature of obtaining ultrasound views of the facial nerve. Given the small diameter of the nerve and complex anatomy of the region, obtaining consistent and accurate images on both sides proved difficult. The differences in quality and precise location of the two images used to take measurements may have accounted for some of the reported variation in diameter. Higher resolution imaging may produce a more accurate measurement of these differences.

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