

Serratus Anterior Palsy as a Masquerader: Utilizing Novel Digital Dynamic Radiography for Diagnosis and Treatment Response

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Summary/Overview

A 55-year-old right-hand dominant female presented with right shoulder pain and dysfunction due to scapular winging. The patient had undergone various surgical interventions to alleviate pain and improve range of motion (ROM), with limited clinical success. In-office Dynamic Digital Radiography (DDR) of the right shoulder demonstrated a reduced ROM and a dysfunctional scapulohumeral rhythm (SHR).

Additionally, an EMG indicated limited conduction through the long thoracic nerve. Together with the DDR and EMG, the patient was diagnosed with serratus anterior SA palsy, and it was determined that split pectoralis-major tendon transfer surgery should be performed.

Approach and Use Case

A physical examination of the patient demonstrated scapular winging and multiple physical tests were undertaken to evaluate ROM and assess pain. Shoulder elevation and abduction reflected asymmetry of the scapula, which, in addition to other shoulder exam metrics, suggested serratus anterior dysfunction. Serratus Anterior Palsy is extremely difficult to diagnose clinically, with traditional imaging such as static radiographs and MRI often considered normal. DDR is a novel radiographic imaging technique that captures pulsed low-radiation radiographs in rapid succession, allowing for the assessment of dynamic motion. DDR provided dynamic visualization of the shoulder joint in motion, giving the surgeon an informed understanding of the pathology and the ability to guide the treatment algorithm appropriately.

DDR was not only able to enable diagnosis of this patient with SA palsy but, through quantification of the range of motion and scapulohumeral rhythm, was able to demonstrate restoration of scapular biomechanics and establish the success of the split pectoralis-major tendon transfer surgical procedure, which was ultimately undertaken. The authors of this case study conclude that “DDR can be used to assist with the diagnosis of SA palsy and other challenging scapular pathologies. Furthermore, it can help track improvements in shoulder function and fluidity following surgical intervention.”

Before



After



Discussion: Clinical and Patient Value

Dynamic Digital Radiography is a promising tool that empowers both the surgeon and the patient, allowing Dr. Wagner to make a more specific in-office diagnosis, potentially improving outcomes and improving patient communication, education, and compliance with therapy. Furthermore, DDR can be used to evaluate response to post-surgical treatment.

DDR can be implemented into clinical workflow to objectively measure parameters such as scapulohumeral rhythm to improve diagnosis and treatment of pathologies such as scapular winging.

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