

Hemiplegic Shoulder Pain



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KEYWORDS

• Stroke • Shoulder pain • Diagnosis • Treatment

KEY POINTS

- Hemiplegic shoulder pain (HSP): Shoulder pain is common after stroke, and it interferes with recovery and lowers quality of life. Multiple causes may contribute, with many experiencing multiple concurrent pathologies.
- Diagnosis: Careful history taking, musculoskeletal examination, and neurologic examinations must be performed. Imaging may aid in diagnosing some causes, although asymptomatic anatomic abnormalities may lead to misdiagnosis.
- Treatment: Conservative treatments should be attempted first, with emphasis on improving the biomechanics of the shoulder and function. Pain should be controlled with both non-pharmacologic and pharmacologic approaches. Some may benefit from more invasive treatments.

INTRODUCTION

The prevalence of HSP among stroke survivors is as high as 84%, although estimates vary depending on study methods.¹ Shoulder pain may develop early in the course of recovery, with an estimated prevalence of 17% in the first week, and remains elevated throughout recovery with 20% to 24% experiencing it from 1 to 16 months after stroke.^{2,3} The prevalence in rehabilitation settings may be higher because this population has a greater number of associated risk factors for shoulder pain. Early diagnosis and appropriate treatment lead to resolution of symptoms in most patients; however, up to 32% of moderate to severely impaired stroke survivors have shoulder pain many years after their stroke.⁴

Shoulder pain after stroke is not limited to a single pathology, and many will be affected by more than one pathologic condition, creating a multifactorial pain syndrome.⁵ The myriad of causes that have been reported includes impingement

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syndrome, rotator cuff dysfunction, tendinopathy, bursitis, adhesive capsulitis, peripheral nerve injuries, complex regional pain syndrome (CRPS), spasticity, central hypersensitivity, and contractures. Similarly, many different risk factors for shoulder pain have also been reported in the literature. The severity of motor impairment is one of the most frequently reported risk factors and also underlies other risks.^{2,3,6–9} The literature has also identified the duration of motor impairment,⁹ sensory impairment,^{3,8} reduced range of motion,⁸ spasticity,¹⁰ central sensitization,¹¹ soft tissue injuries,¹² and comorbidities such as diabetes mellitus as increasing the risk of shoulder pain.^{3,8} Shoulder pain is also common among those without neurologic injury, which makes it likely that stroke survivors may experience shoulder pain that is not related to their stroke.

PATIENT EVALUATION OVERVIEW

The approach to evaluation of a painful hemiplegic shoulder should begin with a history and physical examination, including neurologic examination of the central and peripheral nervous system of the upper limbs, active and passive range of motion, scapular motion, and careful palpation of potential anatomic structures that might generate pain. It is important to gather information from the patient or caregiver regarding prior injuries to the shoulder or premorbid symptoms that might have worsened. Salient features of the examination are described in the following sections relative to specific causes. HSP has neither a standard clinical definition nor a validated clinical examination. Providers need to be aware that many with HSP may have multiple underlying pathologies, may have noncontributory anatomic abnormalities, or may have overriding stroke-related symptoms that make precise diagnosis impossible. It may be helpful to consider the following systematic approach to integrating potential underlying pathologies in HSP: (1) impaired motor control, (2) soft tissue lesions, and (3) altered peripheral and central nervous activity (**Box 1**).¹³

Impaired Motor Control and Tone Changes

Glenohumeral subluxation

Glenohumeral subluxation has been reported to occur in up to 81% of stroke survivors.¹⁴ Subluxation can be measured with the patient seated and the arm in a dependent position allowing the weight of the limb to distract the humeral head from the glenoid fossa.^{10,14,15} Subluxation can be measured by the number of fingerbreadths between the acromion and humeral head, or by radiographs, computed tomography, ultrasonography, and MRI. The fingerbreadth measurement is adequate in clinical practice because the relationship between subluxation and pain remains controversial. Some studies show an association between subluxation and pain,^{1,10} whereas others have demonstrated no association.^{6,15,16} It is likely that subluxation predisposes the shoulder to other types of painful pathologies such as CRPS, peripheral neuropathies, and rotator cuff injury.^{1,17,18}

Scapular dyskinesis

The impaired strength, unbalanced tone, and lack of control of the hemiplegic shoulder can disrupt the timed and coordinated movements known as scapulohumeral rhythm that can increase the risk for HSP.¹⁹ Aberrant recruitment of the infraspinatus muscle, serratus anterior muscle, and inferior trapezius muscles that stabilize the scapula during humeral movement have been found in those with HSP compared with pain-free stroke survivors, and the aberrant patterns are similar to recruitment patterns seen in nonstroke impingement syndrome of the shoulder.²⁰ Evidence of impaired shoulder control can be detected with observation of scapular movement,

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