

Asymptomatic enlargement of the clavicle : A review of underlying aetiologies

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An asymptomatic enlargement of the medial clavicle is a condition that is often both missed and misdiagnosed. We review the most common causes of an isolated and asymptomatic enlargement of the medial clavicle. Underlying aetiologies include osteoarthritis of the sternoclavicular joint, condensing osteitis, spontaneous dislocation of the sternoclavicular joint, and sternocostoclavicular hyperostosis. Key points in the history and physical examination as well as characteristic radiographic findings are sufficient for correct diagnoses. Treatment is conservative.

Keywords : clavicle ; enlargement ; aetiology.

INTRODUCTION

An isolated enlargement of the clavicle, though often encountered in clinical practice, is rarely appropriately diagnosed. This trend has been attributed to a lack of familiarity with dealing with such pathologies (19). Stemming from several underlying orthopaedic pathologies, this asymptomatic nodule, when identified, will often result in an unnecessary diagnostic workup that is costly and often uncomfortable for the patient (24). The limited experience and exposure of clinicians in dealing with this complaint results in difficulty with diagnosis ; however, the diagnosis can usually be established through careful history and physical examination (19). As primary neoplasms of the clavicle are rare, it is vital for the physician to be aware of the differential diagnosis of an asymptomatic, isolated swelling of the medial

clavicle (16). When accurately identified, diagnosis and treatment of an asymptomatic enlargement of the clavicle is conservative, obviating the need for invasive diagnostics and patient distress. Below we consider the four most commonly encountered aetiologies.

Osteoarthritis of the sternoclavicular joint (SCJ)

Although osteoarthritis (OA) is often considered a disease of the hands and knees, OA of the sternoclavicular joint (SCJ) is present in over 90% of the affected population. In the majority of the affected population, SCJ arthritis has a bilateral presentation (8,23). When present unilaterally, SCJ arthritis is often correlated with a greater degree of pain and discomfort and is often linked to physical stress that tends to be self-limiting (16). However, it is an often missed diagnosis due to its sometimes asymptomatic and asymmetrical presentation, with-

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out accompanying restriction in range of motion or discomfort (24). Radiological assessment is often inconclusive, requiring an integrated use of MRI and CT (16). Biopsy is seldom warranted and conservative therapeutics should generally be used when possible (26). The treatment choices are generally conservative, consisting of rest, analgesia and behaviour modification (23). The general treatment approach is : first line treatment – observation, rest and NSAID analgesics ; second line – intra-articular ultrasound guided corticosteroid injection ; third line – excision arthroplasty of the medial clavicle (16).

Condensing Osteitis of the Medial Clavicle

First described in 1974 by Brower *et al*, condensing osteitis of the clavicle (COC) is defined as a characteristic swelling of the medial third of the clavicle with concomitant radiographic evidence of sclerosis (1,6). Most notably, the diagnosis of COC depends on the lack of involvement of the sternoclavicular joint, costal cartilage and adjacent ribs on imaging studies in addition to the aforementioned clavicular radiographic findings and patient history (16). Thus, COC can be distinguished from osteoarthritis by the unaffected manubrium and preservation of the joint space. Because the presentation can be asymptomatic outside of the medial clavicular swelling, this condition can often be overlooked.

COC, a rare condition, has been explained by a variety of mechanisms including mechanical stress, trauma and infection, particularly in the paediatric population (7). It occurs most frequently in women aged 20-60. The presentation is often accompanied by pain on abduction, a lack of overlying skin changes and is almost exclusively unilateral (4). Radiographically, medullary obliteration and the expansion of the medial aspect of the clavicle can be seen in addition to clavicular sclerosis (4). Although biopsy is not necessary when the clinical and radiographic picture is clearly indicative of COC, an incisional biopsy is sometimes warranted when the aetiology is questionable (9). The treatment, if no severe pain of restriction of movement is noted, is conservative and is limited to observation. When pain is present but manageable, treatment is usually limited to NSAID analgesics (4,24).

Spontaneous Dislocation of the Sternoclavicular Joint

Although sternoclavicular joint dislocations are often accompanied by pain exacerbated by arm supination, asymptomatic enlargement over the sternoclavicular joint has been noted, namely in spontaneous dislocation of the sternoclavicular joint (SDSCJ) (17). SDSCJ, most commonly seen in middle-aged women, is associated with mild, if any, discomfort and is generally painless. There is usually an absence of a history of trauma and the sole presenting symptom is a protruding hard nodule overlying the SCJ (12,17). In a five year study, Sadr *et al* demonstrated that pain was only reported in 13% of patients, with only 9% reporting an aching feeling, while all of the patients reported a swelling over the SCJ (17). SDSCJ has also been noted to have a familial occurrence with a chronic painless presentation marked only by a nodule overlying the clavicle and unilateral dislocations occurring secondary to routine movement (12).

The majority of patients presenting with SDSCJ require no treatment ; if mild pain is present, it is usually self-limiting within a four-month period. Because the diagnosis can be made clinically and imaging studies are both unnecessary and often misleading, a referral to orthopaedics is generally warranted without an initial radiologic work-up. As a general rule, it is best to avoid unnecessary and sometimes dangerous biopsies (17). The preferred treatment for anterior dislocations, though controversial, is currently observation (2). Nevertheless, the physician must remain vigilant of posterior dislocations that carry a higher risk of complication and often require an orthopaedic intervention (10,11).

Sternocostoclavicular Hyperostosis

Sternocostoclavicular Hyperostosis (SCCH), first described by Sonozaki in 1974, is a benign ossifying diathesis marked by soft-tissue ossification of the space between the posterior clavicle and the anterior aspect of the upper ribs (13). Primarily affecting men aged 40-60, SCCH, previously considered to be extremely rare, has been postulated to be an inherently underdiagnosed entity (18).

Because the features of SCCH are poorly identified and inexact, the disorder may present with a variety of pathologies, from cellulites, nodular lesions over the hands and feet and bilateral soft-tissue swelling over the medial clavicles to asymptomatic unilateral erythematous swelling of the clavicle (15,18). Sartoris *et al*, for example, reported a case of a painless unilateral erythematous swelling over the medial clavicle lasting for years and unaccompanied by other symptoms which, upon CT radiography, was confirmed as SCCH (18). The changes are often bilateral and can present with pain, burning, and swelling or be completely asymptomatic. There is a common concordance of palmar and plantar pustulosis in patients with SCCH, prompting the proposal of the new term *pustulotic arthroosteitis*, a seronegative spondyloarthropathy, to describe the constellation of symptoms. Therefore, the presence of either pathology in the presence of an asymptomatic swelling of the medial clavicle should promptly raise suspicion of SCCH as the underlying entity (14,15, 20,21). Often associated with other ossifying conditions such as ankylosing spondylitis and diffuse idiopathic skeletal hyperostosis, the aetiology of SCCH to date remains undetermined (14,5).

Radiographically, hyperostosis of the median two-thirds of the clavicle with concomitant ossifying masses in the costoclavicular space can be appre-



Fig. 1. — 69 year-old woman presented for evaluation of painless enlargement over her clavicle. The lesion was misdiagnosed as a lipoma and the patient was referred to a dermatologist for excision.

ciated (22). Though not always present, the traditional radiographic findings are rather specific and can often make a painful and dangerous biopsy unnecessary for diagnosis (3). Because the hyperostosis can impinge on the subclavian vein and cause upper body venous congestion, vigilance for symptoms of venous stasis remain extremely important (5). If such symptoms are evident, a prompt referral to orthopedics is necessary. Although the treatment can be both observation and anti-inflammatory drugs, surgical resection remains an important and sometimes necessary intervention (20).

DISCUSSION

Asymptomatic enlargements of the medial clavicle, due to their frequently slow progression and benign nature, can often be overlooked. When noticed, they may be mistaken for a lipoma or a possible primary neoplasm of the clavicle. Because of the frequent physicians' discomfort and unfamiliarity with such lesions, invasive biopsies and expensive imaging techniques are utilized. Since an asymptomatic enlargement of the clavicle is most often due to one of several rarely discussed benign orthopaedic aetiologies, this results in unnecessary diagnostics and much distress to the patient. The purpose of this article, therefore, is to assist in the correct workup, diagnosis, and treatment of the underlying pathologies of an asymptomatic enlargement of the medial clavicle as well as propose the appropriate abstinence from diagnostic workups when they are not warranted.

In most cases, a careful physical examination as well as a directed history can elucidate the aetiology of the enlargement. The temporal progression of the lesion, accompanying symptoms throughout the history of its presence, past history of other diseases of the musculoskeletal system, as well as the limitation in mobility of the affected side should be noted. A detailed physical examination focusing on the characteristics of the lesion on palpation, the exact location of the lesion, the presence or absence of the involvement of the sternoclavicular joint, the manubrium, and the upper ribs, range of motion, as well as a careful examination of the rest of the body for similar lesions should be conducted. For example,

spontaneous dislocation of the sternoclavicular joint has a very specific clinical presentation, and can most times be diagnosed on history and physical alone. At the same time, plain radiography is an extremely useful tool in distinguishing an underlying orthopaedic aetiology and helping to differentiate it from the often mistakenly diagnosed lipoma. With the use of plain radiography, condensing osteitis and sternoclavicular hyperostosis, which have a very distinctive radiographic appearance, can be identified. It should also be noted that while the aforementioned pathologies present as asymptomatic enlargements, they may also present with accompanying symptoms.

It is, however, important to note that while an asymptomatic enlargement of the clavicle is most commonly due to the benign orthopaedic pathologies listed above, primary neoplasms of the clavicle, though rare, may present in a similar manner. Therefore, careful histories and physicals and proper vigilance are always warranted when new or worrisome nodules are noted.

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