

Condensing Osteitis of the Medial Clavicle – An Intermediate-term Follow-up

KK Sng,¹MBBS, BK Chan,¹FRCS (Glas), FRCS (Edin), FAMS, AJ Chakrabarti,²MBBS, FRCS (Orth), SN Bell,²MBBS, FRACS, FA (Orth),
CO LOW,¹MBBS, FRCS (Glas), FAMS

Abstract

Introduction: Condensing osteitis of the clavicle is a benign idiopathic condition affecting the medial end of the clavicle, and is characterised by sclerosis and expansion of the clavicular head. **Materials and Methods:** Nine cases of condensing osteitis were reviewed. Their mean age was 37 years (range, 22 to 65 years). All patients presented with pain and swelling localised to the sternoclavicular region. The mean length of follow-up was 38 months (range, 9 to 77 months). **Results:** At latest follow-up, all patients had subjective improvement in their pain symptoms, but none had any subjective decrease in the swelling around the medial clavicle. Follow-up computerised tomography (CT) scans were available for analysis in 5 patients. **Conclusion:** The results of this study show that in the intermediate term at least, the severity of the pain appears to improve with time, although the clinical swelling over the medial clavicle does not resolve significantly. Longer follow-up will further define the long-term natural history of this rare condition.

Ann Acad Med Singapore 2004;33:499-502

Key words: Clavicles, Sclerosis, Shoulder pain, Sternoclavicular joint

Introduction

Condensing osteitis of the clavicle is an idiopathic condition affecting the medial end of the clavicle, and is characterised by sclerosis and expansion of the inferior part of the clavicular head.¹⁻⁶ The rarity of this disorder is highlighted by the experience of the senior author (SN Bell). In 12 years of practice, during which accurate records were kept, 5674 shoulder disorders were encountered. Twenty-eight of these (0.49%) were related to the area around the sternoclavicular joint and of these, 9 (0.16%) were diagnosed as condensing osteitis of the clavicle.

Previous reports have highlighted that condensing osteitis follows a benign course.^{1,2,4,6-11} However, the longest follow-up in the literature has not exceeded 12 months. In this intermediate term follow-up study using clinical and radiological (Fig. 1) assessment, 9 cases of condensing osteitis of the clavicle were reviewed. We demonstrated the clinical and radiological features of long-standing untreated condensing osteitis of the clavicle and further define the natural history of this condition.

Materials and Methods

Nine cases of condensing osteitis of the clavicle were

reviewed. There were 8 females and 1 male. The mean age of the patients was 37 years (range, 22 to 65 years). All patients were right-handed. All patients had unilateral disease. Seven had involvement of their dominant side. At presentation, all patients had complained of severe pain localised to the sternoclavicular region and this was associated with swelling which was marked in all but 2 cases.

The diagnostic criteria included the following: (1) Increased uptake at the affected medial clavicle on bone scan; (2) normal ESR and C-reactive protein levels; (3) normal serum calcium and alkaline phosphatase levels; and (4) computerised tomography (CT) scan showing no evidence of infection or tumour in the medial clavicle, and no evidence of osteoarthritis of the sternoclavicular joint.

All except 3 cases received a course of physiotherapy prior to the diagnosis and response to these treatments was limited and usually unsuccessful. Two patients received single intraarticular injections of steroid from their general practitioners.

The mean length of follow-up was 38 months (range, 9 to 77 months). The original diagnosis was made based on

¹ Department of Orthopaedic Surgery
Changi General Hospital, Singapore

² Upper Limb Unit, Musculoskeletal Program
Monash Medical Centre, Victoria, Australia

Address for Reprints: Dr Kevin Kaity Sng, Department of Orthopaedic Surgery, Changi General Hospital, 2 Simei Street 3, Singapore 529889.

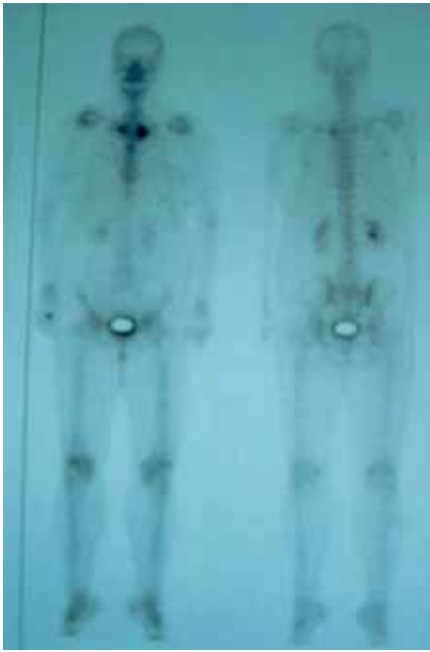


Fig. 1. Bone scan of a patient with condensing osteitis showing increased uptake at the medial end of the left clavicle.

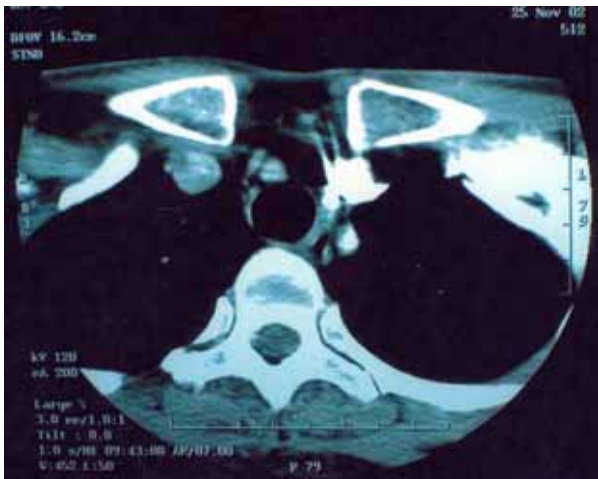


Fig. 2. CT scan of a patient with condensing osteitis of the right medial clavicle. Note the soft tissue swelling anterior to the medial clavicle of the affected side.

clinical and radiological features as listed in Table 1. No patient was treated surgically for this condition.

At the follow-up interview, each patient was reviewed clinically and their shoulder pain was scored according to the American Shoulder and Elbow Surgeons shoulder assessment and with a visual analogue pain scale (VAS). Pain scores at the time of initial presentation were, however, not documented and unavailable for comparison. CT scans from the time of diagnosis were reviewed and repeat CT scans of the medial clavicle were performed. Radiological and clinical results were analysed.

Results

At the latest follow-up, only 2 patients reported complete resolution of pain symptoms, 9 and 24 months after the onset. Five other patients had slight pain with VAS scores of less than 4/10. Pain was reported as moderate in 2 patients. However, all patients showed subjective improvement in their pain symptoms. Interestingly, these 2 patients with moderate pain were the only 2 who had received intraarticular steroid injections from their general practitioners.

The prominence of the medial clavicular area that had been noted at the initial examination persisted clinically at the time of the final follow-up. None of the patients had any subjective decrease in the extent of the swelling around the medial clavicle.

The follow-up CT scans in 5 patients were available for analysis. There was no increase in the extent of the bony expansion in all the scans. With respect to the degree of sclerosis, 4 of the 5 patients showed a partial resolution of the sclerosis as compared with the scans at initial presentation. The remaining patient showed no evidence of sclerosis in the follow-up CT scan. The thickness of the soft tissue anterior to the medial end of the clavicle was also compared. Four patients had slight reduction in the soft tissue swelling but the remaining 1 did not show any significant improvement in the soft tissue swelling.

Table 1. Clinical and Radiological Features of our 9 Patients with Condensing Osteitis

Case number	Sex	Age	Affected side	Dominance	Visual Analogue Scale (Pain)	American Shoulder and Elbow Surgeons Pain Score	Total duration of symptoms (months)	Length of follow-up (months)
1	Male	65	Right	Dominant	0	Slight	24	24
2	Female	34	Right	Dominant	3	Slight	41	77
3	Female	36	Right	Dominant	1	Slight	49	55
4	Female	32	Right	Dominant	7	Moderate	32	70
5	Female	39	Left	Non-dominant	4	Moderate	8	24
6	Female	40	Right	Dominant	3	Slight	26	40
7	Female	35	Left	Non-dominant	3	Slight	18	22
8	Female	34	Right	Dominant	0	Slight	8	9
9	Female	22	Right	Dominant	2	Slight	20	20

Table 2. Clinical and Radiological Features of our 9 patients with Condensing Osteitis

Case number	Swelling over medial clavicle at last follow-up	Sclerosis (compared to previous films)	Bone expansion (compared to previous films)	Soft tissue swelling (compared to previous films)
1	Present	Reduced	No change	Reduced
2	Present	Absent	No change	Reduced
3	Present	Scans not available	-	-
4	Present	Reduced	No change	No change
5	Present	Scans not available	-	-
6	Present	Reduced	No change	Reduced
7	Present	Reduced	No change	Reduced
8	Present	Scans not available	-	-
9	Present	Scans not available	-	-

Discussion

Condensing osteitis of the clavicle is an idiopathic condition affecting the medial end of the clavicle and was first described in 1974 by Brower et al.¹² It is characterised by sclerosis and the expansion of the inferior part of the clavicular head. There is a notable absence of the involvement of the sternoclavicular joint, manubrium or adjacent osteochondral junctions. It is a rare condition predominantly seen in females of late childbearing age. It has been postulated that repetitive mechanical stresses have a role in the aetiology, but to date, the exact cause remains unknown.^{4,6,8,13} The medial clavicle is expanded, with overlying soft tissue swelling (Fig. 2). Histologically, the bone shows thickened trabeculae demonstrating both lamellar and woven components.^{8,11} The presence of devitalised bone evidenced by empty lacunae and marrow fibrosis also suggests that a remodelling process is occurring. Although a periosteal reaction may be demonstrated histologically, this feature is absent both macroscopically and in radiological studies.⁸

Based on histopathology, this is a benign condition and many authors have advocated a conservative approach in terms of invasive diagnostic procedures and treatment modalities. Incisional biopsies in previous reports have shown consistent histological features and in the short term, the patients appear to improve. In a report by Lissens et al,⁴ 2 cases of condensing osteitis were followed-up for 3 to 6 months after diagnosis. Their findings were similar to ours in that both patients still complained of pain, despite having shown considerable improvement. The swelling over the medial clavicle remained in both cases. However, long-term studies on the natural progression of this condition beyond this period of time are not available.

The results of this intermediate-term study suggest that the severity of pain symptoms appear to improve with time. Two patients had complete resolution of pain, with the other 7 having some degree of residual pain. However, all 9 patients reported a subjective improvement in their pain compared to that at the time of initial presentation. Clinically,

the swelling over the medial clavicle continued to persist with no subjective decrease in size in all our patients. CT scans of the region in 5 of our patients have shown that the medial clavicle did not appear to change in size. However, in the available scans, the sclerosis of the medial clavicle appears to have decreased over the period of time and coincided with the partial resolution of pain symptoms. This sclerotic reaction is thought to be due to a response to mechanical stress^{4,6,8} or bone remodelling secondary to an unknown cause.^{9,13} This finding suggests that the degree of bone turnover activity in the medial clavicle is linked to the severity of pain symptoms. A repeat radionuclide scan of the region would have been helpful in supporting this, but was not included in the protocol at follow-up.

Several difficulties were faced in the course of this study. Firstly, the pain scores at the initial presentation were not documented, which deprived the authors of meaningful data for objective comparison of the severity of symptoms over this extended period of time. Secondly, the authors had difficulty in quantifying the degree of sclerosis in the repeat scans and judging the decrease in the degree of sclerosis remained subjective. All our patients have radionuclide scans at the initial presentation and a repeat scan at this stage would have been helpful in correlating the decrease in pain symptoms with a concomitant decrease in bone turnover in the medial clavicle.

Conclusion

The results of this study have shown that, in the intermediate-term at least, the severity of the pain over the medial clavicle appears to improve with time. Clinical swelling over the medial clavicle does not resolve significantly and most of the radiological features identified at the time of presentation have persisted. The decrease in sclerosis in 5 of our patients with CT scans may suggest that the severity of pain is linked to the bone turnover activity at the medial clavicle. Longer follow-up, together with repeat radionuclide scans, will further define the natural history of this rare condition and the relationship between the pain severity and bone turnover activity.

REFERENCES

1. Rand T, Schweitzer M, Rafii M, Nguyen K, Garcia M, Resnick D. Condensing osteitis of the clavicle: MRI. *J Comput Assist Tomogr* 1998;22:621-4.
 2. Noonan PT, Stanley MD, Sartoris DJ, Resnick D. Condensing osteitis of the clavicle in a man. *Skeletal Radiol* 1998;27:291-3.
 3. Berthelot JM, Mabilille A, Nomballais MF, Maugars Y, Robert R, Prost A. Osteitis condensans of the clavicle: does fibrocartilage play a role? A report of two cases with spontaneous clinical and roentgenographic resolution. *Rev Rhum Engl Ed* 1995;62:501-6.
 4. Lissens M, Bruyninckx F, Rosselle N. Condensing osteitis of the clavicle. Report of two cases and review of the literature. *Acta Belg Med Phys* 1990;13:235-40.
 5. Jones MW, Carty H, Taylor JF, Ibrahim SK. Condensing osteitis of the clavicle: does it exist? *J Bone Joint Surg Br* 1990;72:464-7.
 6. Kruger GD, Rock MG, Munro TG. Condensing osteitis of the clavicle. A review of the literature and report of three cases. *J Bone Joint Surg Am* 1987;69:550-7.
 7. Vierboom MA, Steinberg JD, Mooyaart EL, vanRijswijk MH. Condensing osteitis of the clavicle: magnetic resonance imaging as an adjunct method for differential diagnosis. *Ann Rheum Dis* 1992;51:539-41.
 8. Greenspan A, Gerscovich E, Szabo RM, Matthews JG 2nd. Condensing osteitis of the clavicle: a rare but frequently misdiagnosed condition. *AJR Am J Roentgenol* 1991;156:1011-5.
 9. Outwater E, Oates E. Condensing osteitis of the clavicle: case report and review of the literature. *J Nucl Med* 1988;29:1122-5.
 10. Stewart CA, Siegel ME, King D, Moser L. Radionuclide and radiographic demonstration of condensing osteitis of the clavicle. *Clin Nucl Med* 1988;13:177-8.
 11. Baciu CC, Muncaciu S, Dumitrescu D. Condensing osteitis of the middle third of the clavicle. *Rev Chir Oncol Radiol O R L Oftalmol Stomatol Chir* 1989;38:381-6.
 12. Brower AC, Sweet DE, Keats TE. Condensing osteitis of the clavicle: a new entity. *Am J Roentgenol Radium Ther Nucl Med* 1974;121:17-21.
 13. Appell RG, Oppermann HC, Becker W, Kratzat R, Brandeis WE, Willich E. Condensing osteitis of the clavicle in childhood: a rare sclerotic bone lesion. Review of literature and report of seven patients. *Pediatr Radiol* 1983;13:301-6.
-