Driller Wrist (Vibratory Arthropathy)

Matthew D. Rifkin, M.D., and Richard B. Levine, M.D.
Department of Radiology, Thomas Jefferson University Hospital, Philadelphia, Pennsylvania, USA

Abstract. Driller wrist is an occupational disease with pathophysiologic changes resulting from recurrent use of vibratory tools. The entity includes the clinical finding of Raynaud phenomena with or without associated bone changes in the wrist. Osseous involvement is usually mild and is associated with cystic changes of the carpals and occasionally other structures. Two cases are reported, one with typical cystic abnormalities and the other with more severe disease which progressed to joint instability.

Key words: Driller disease – Occupational disease – Vibratory disease – Osteonecrosis

Extensive research has documented that workers using various equipment emitting constant vibration are prone to develop Raynaud phenomena. The pathophysiologic mechanism is based on a traumatic vasospastic reaction [1–3, 5, 6]. Although cystic changes of the phalanges, radius, and ulna do occur [1], it is much more common to have these findings present solely in the carpals [1, 4, 5, 8]. Most reports have described minimal to moderate cystic changes, which may rarely lead to pathologic fracture. Severe involvement and progression of disease and joint instability have rarely been discussed.

Case Reports

Case 1

A 48-year-old man with a 20-year history of working as a riveter in a naval yard presented with a chief complaint of arthritis.

Fig. 1. Case 1. Radiograph of the left wrist demonstrates minimal subarticular cystic changes in the carpals, radius, and ulna.
limited to the wrists, more severe on the left side. Tingling of the fingers had occurred intermittently, but no history of significant Raynaud phenomena was elicited. Radiographs demonstrated minimal cystic changes of the carpals without significant joint space narrowing (Fig. 1).

Case 2

A 57-year-old man presented with bilateral wrist pain, more persistent on the left. Severe sensitivity to cold was also present for 10 years. He has been a pneumatic driller for a highway construction crew for the previous 20 years. Radiographs of the hand and wrists (Fig. 2) demonstrated cystic changes of the carpals. The joint spaces were relatively well preserved and the left hand was more severely affected. The patient limited but did not discontinue his use of the pneumatic drill and was followed. Severe progression was noted one year later with marked joint space narrowing (Fig. 3). Pain worsened and sensation at the fingertips continued to diminish. Follow-up radiographs three years after the initial consultation demonstrated severe cystic changes and joint space obliteration on the left side (Fig. 4). The right wrist showed no significant progression. Left-sided joint instability became evident and its severity required intraoperative stabilization.

Discussion

The clinical findings of Raynaud phenomena including numbness, blanching of the fingertips,