The Petrified Ear

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Key Words
Petrified ear
Pinnal ossification
Exposure to hypothermia
Auricular calcification
Ectopic ossification

Abstract
A case of a otherwise healthy 66-year-old male with bilateral symmetric ossification of his ears is described. The rare occurrence of petrified ears is emphasized, and possible etiologic factors are discussed. No other explanation than anamnestic prolonged exposure to hypothermia was found.

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Case Report
A 66-year-old male presented with symmetric and asymptomatic stiffening of both auricles. The induration had started 4 years ago, and his ears later changed to stone-hard consistency. The overlying skin was normal. The only complaint was discomfort while sleeping in a lateral position. The otherwise healthy patient denied any history of frostbites, but during his extensive skiing tours prolonged exposures to cold occurred. He could not recall any mechanical trauma, soreness or inflammation to the ears that might have caused tissue damage. Examination of the ears revealed both auricles to be of normal configuration but entirely rigid, except for the lobule (fig. 1). Sensation was normal. A symmetric presbycusis could be diagnosed. X-rays showed calcification of both auricles in a trabecular pattern suggestive of ossification (fig. 2). Biopsy of the right auricle revealed ear cartilage with change-over to lamellar bone (fig. 3). This process of ossification was limited to his ears.
Laboratory data (including complete blood cell count, electrolytes, calcium, inorganic phosphorus, alkaline phosphatase, uric acid, glucose, antinuclear antibodies, parathormone, adrenocorticotropic and cortisol) were within normal limits. Radionuclide imaging showed active bone metabolism within the ears but was otherwise normal.

Discussion

The petrified auricle is a rare clinical entity in which the entire ear becomes stone-hard. This condition occurs as a result of inflammation, local trauma or after frostbites [1]. It may also occur in association with a variety of systemic diseases with adrenal insufficiency being the most common [2]. Other diseases include diabetes mellitus, sarcoidosis, ochronosis, acromegaly, hypopituitarism, hyperthyroidism, systemic chondromalacia, familial cold hypersensitivity, senility or following radiation therapy [1-6]. In 1866 the anatomist Bochdalek first described auricular ossification in Prague in a 65-year-old male cadaver as cited in Di Bartolomeo [1]. In
reviewing the literature approximately 140 cases of auricular calcification or ossification have
been reported since then, but there were only 11 patients with histologically proven ossification
[1]. In general, the condition affected usually patients over the age of 50 years. Newer case
reports describe histologically proven ossified auricles after repeated minor trauma [4] and after
frequent episodes of frostbites [7]. The blood supply to the cartilage of the auricles comes from
the dermal vessels, and probably

Fig. 3. Section of the ear cartilage showing lamellar bone formation. HE. ×25.5.
actinic damage, cold exposure and mechanical trauma induce secondary trophic damage to the
cartilage with resulting dystrophic calcification. Di Bartolomeo [1] described that after frostbites
the pathologic process usually involves replacement of the elastic cartilage by ectopic bone. Also
bone formation in the external auditory canal following chronic mild hypothermia caused by
exposure to cold water is observed in surfers [1], but the mechanism of ectopic ossification
remains unclear. In the absence of any other influencing factor in our case, repetitive exposure to
hypothermia might have influenced ectopic ossification.

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