An 18-year-old girl working as a lifeguard in a swimming pool presented with a fall on the slippery wet floor of the pool, landing on her right shoulder and back of her head. She had pins and needles in the fingertips of the right upper limb. She did not have any neurological deficits. Computed topographic scan (CT) of cervical spine showed evidence of rotatory atlantoaxial dislocation. Interestingly however, there was a distinct smiling face in the axial sections of the odontoid process [Figure 1]. MRI scan of cervical spine was normal. The patient subsequently underwent closed reduction using halo traction for two weeks. CT scan confirmed satisfactory reduction. She was mobilized with a Philadelphia collar.

The smiling appearance is due to the disposition of the trabecular bone in the odontoid process, although Stevenson et al. ascribed it to cortical bone invaginating into the less dense trabecular bone. The odontoid process contains considerable density of trabecular bone, with a striking nidus of very dense bone approaching the density of cortex. This nidus is located near the center of the tip of the odontoid process and has a definite elongation in the anteroposterior direction. There is no clear explanation for this nidus or its function, although it may represent a response of the bone to significant external forces. The normal variation in the anatomy of this nidus gives rise to the smiling face, with the eyes and mouth representing the normal trabecular bone and the rest of the face the dense trabecular bone.

References


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Figure 1: (A and B) CT scan, axial cuts showing the smiling face in the odontoid process. (C) Coronal reformat revealing the cortical density trabecular bone in the odontoid process