



# A Case of Slowly Enlarging Nodules

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## Clinical image description

Pictured here are subcutaneous nodules of the right lower extremity of a 74-year-old patient with a past medical history of prostate cancer and Freon inhalation since his mid-30's. These nodules have been sporadically and progressively enlarging since the patient first noticed them in 2010. They are non-tender and have no associated overlying skin changes aside from dry skin and resulting pruritus. X-Ray imaging identifies these subcutaneous nodules as osseous in nature. The ossification is non-continuous with the medullary cavity and there is associated diffusely increased bone density.

In 2014, the patient sought medical counsel and was worked up for differential diagnoses including heterotopic ossification,

fibrous dysplasia, fluoride toxicity, sarcoidosis, calciphylaxis, Ehlers Danlos Syndrome, tertiary syphilis, melorheostosis, and osteochondromas. Findings were most consistent with skeletal fluorosis secondary to a history of Freon inhalation, and the patient subsequently discontinued Freon use.

The patient presents today (July 2020) with pathologic fractures of his left clavicle and right iliac bone, with a history of bilateral rib fractures seen on imaging in 2018. These pathologic fractures are likely secondary to the diffuse increase in bone density secondary to skeletal fluorosis, or possibly secondary to bony metastases from prostate cancer - the changes on imaging secondary to his skeletal fluorosis lessens the ability to identify new metastases.





Freon is a hydrofluorocarbon used in air conditioning and refrigeration with fumes said to smell like nail polish remover. Recreational inhalation leads to short-lived high similar to alcohol intoxication. A deleterious side effect of consumption is accumulation of systemic fluoride leading to Fluorosis. With high levels of Fluoride bones become hardened and less elastic, develop nodules and result in an increased frequency of fractures. It is more commonly seen in industrial workers with accidental exposure or in consumption of fluoride from drinking water. Symptoms of excess Fluoride systemically are mainly seen in the bone structure. Bony accumulations are common with this disorder although not typically as pronounced as in this patient.



Pictured here is a whole-body Nuclear Medicine Bone Scan showing multiple exophytic foci of increased uptake in the bilateral forearms, lower legs, bilateral ribs and right L4 vertebral body. From this imaging alone, it is unclear whether the foci are extending from bone or isolated to soft tissues. Biopsy of nodule on right tibia showed benign bony overgrowth with excess fluoride. Serum Fluoride resulted at 5.2 mg/L (reference interval <0.2 mg/L). Patient endorsed habitual use of inhaled Freon to achieve intoxication for years. Diagnosis of fluoride toxicity from inhaled Freon causing rapid bony deposition and turnover. Patient ceased Freon use following diagnosis and lesions stopped growing but remained. Was subsequently started on Forteo.