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Image Article

Radiologically Visible Kidney Stone's Concentric and Radial Layers

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All the steps leading to the formation of urolithiasis define lithogenesis. These steps are well known: saturation and super saturation of urine, (homogeneous or heterogeneous) nucleation, crystal aggregation and growth, crystal retention and stone formation. The growth rate of kidney renal stone can be very variable, depending on the level of super saturation and the nature of the present metabolic abnormalities.

We present here the case of a 65 years old obese woman, with a medical history of hypertension, under salt-free diet and calcium antagonist, who has been consulting for a right lumbar pain for 2 years. A KUB (kidney, ureter and bladder) X-ray showed a 17 mm calcic image on the right renal area. It had a highly radio-opaquecore, then a radio-lucentlayer, and finally a weakly radiopaque layer. The patient underwent ESWL (extracorporeal shock wave lithotripsy). The stone spectrophotometric analysis concluded for a wheddelite core, then an acid uric intermediate layer, and finally a struvite peripheral layer.

When lithogenesis is due to diet, stone growth is made of flare-ups, which can explain the presence of concentric layers in the stone analysis. In rare situations, these layers are made of totally different chemical components, and can thus have a totally different aspect in the KUB x-ray. In our case, salt-free but high-protein diet probably stopped/slowed the core growth, resulting in formation of a new layer of uric acid. Finally, the presence of a chronic infection of the urinary tract by urease producing led to struvite layer formation.

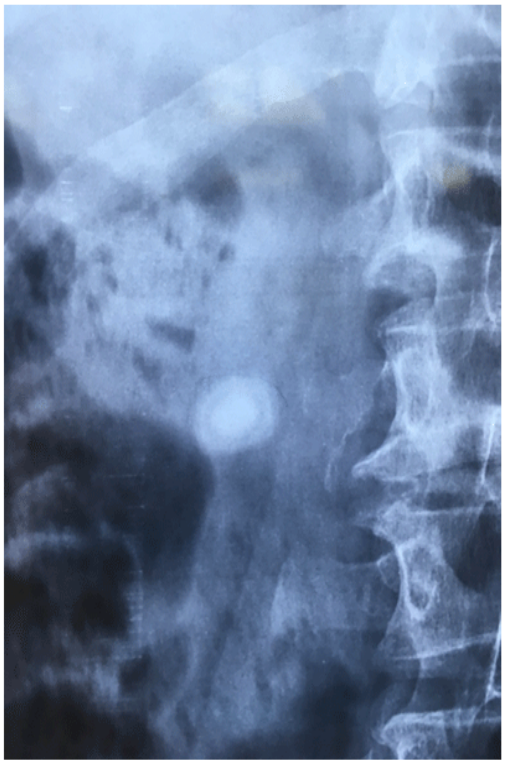

Figure 1. KUB X-ray showing the three-layers renal stone

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