Post-ESWL fragments as core of new kidney stones

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Keywords: calcium oxalate kidney stones; post-ESWL fragments; regrowth

The use of extracorporeal shockwave lithotripsy (ESWL) to treat kidney stones gives excellent fragmentation results. However, the retention of post-ESWL fragments within the kidney remains a serious health problem. A study carried out on calcium stone patients showed that only 32% of these were found to be stone free 12 months after ESWL [1]. Therefore, the persistence and the growth of fragments seem to be common after ESWL [2,3].

After ESWL, stone-free rates are closely related to stone location, size, number and composition, so a complete stone analysis of the first ESWL residual available must be carried out in order to perform the following treatments correctly so as to prevent recidivism.

Kidney stones collected from two patients previously treated with ESWL were chosen for this study (Figures 1 and 2).

The main component of these kidney stones is calcium oxalate monohydrate (whewellite, CaC$_2$O$_4$·H$_2$O) mixed with uric acid (C$_5$H$_4$N$_4$O$_3$), identified by X-ray diffraction analysis. A microscopic examination was made on petrographic thin section with a stereomicroscope coupled to polarizing microscope in order to provide information on the internal structure, location and type of core.

The results show that these kidney stones were due to a regrowth on post-ESWL fragments.

In both cases, the ESWL treatment has not reduced the previous stones in fragments of dimensions easy to be expelled or eliminated with an appropriated pharmacological treatment [4]. In the latter case (Figure 2), the residual fragment is very small (1 mm), not easily visible and recognizable only by a careful analysis, while the former stone (Figure 1) is made of a fragment of remarkable dimensions.

Obviously, stone fragment regrowth is an unfavourable factor for spontaneous passage, and consequently an additional serious complication of post-ESWL residual stones.

Conflict of interest statement. None declared.

Fig. 1. Case 1—image obtained by a stereomicroscopy of a post-ESWL fragment of a mixed kidney stone (whewellite and uric acid layers) with in vivo regrowth.

Fig. 2. Case 2—mixed kidney stone (whewellite and uric acid) with the core formed by a post-ESWL fragment identifiable by polarizing microscopy on petrographic thin section.
References


Received for publication: 2.3.10; Accepted in revised form: 10.3.10