Reviewer's report

Title: Study of the factors that affect the regrowth of calcium oxalate dihydrate fragmented calculi

Version: Date: 18 April 2006

Reviewer: David Goldfarb

Reviewer's report:

General

Major Compulsory Revisions (that the author must respond to before a decision on publication can be reached)

Methods:
1. is the entire surface area of the stone fragments exposed to the artificial urine? how are the fragments mounted?
2. some experiments were done for 48 hours, others for 192 hours. Why were these different times chosen, why were times not uniform? Chow et al has studied fragments for up to 32 days.
3. Was the weight of the fragments measured only once, after the specified time? or repeatedly? Were the fragments dried prior to being weighed?
4. "growth of the different fragments...was uniformized by using the relative mass increase": the meaning of this is unclear since the results were reported as ug/mg-h, which would appear to be the absolute, not relative, mass increase. There is no control for surface area. A 2 mm fragment has surface area, relative to volume, greater than a 4 mm fragment; yet the 4 mm fragment obviously has the larger absolute surface area. Some adjustment for growth relative to surface area would seem appropriate. The authors need to demonstrate that there is no difference in the size or weights of the fragments used in the different conditions that could account for the differences in growth rates.
5. synthetic urine: what is the osmolality of the urine? why is urea not included in this "urine". I note that Chow et al also do not have urea in their solution, though osmolality is a contributor to relative supersaturation. Does urea have any effect on supersaturation?

Results:
1. a problem is the identification of the crystal phases that arise: the authors do not state how they quantitate "low amount" vs. "large amounts" of crystals; no data are given and no statistical comparisons are possible. They appear to identify the crystals only based on the morphology seen on SEM, a technique which they have not validated. The figures would benefit from labels demonstrating the different crystal phases, but they do not illustrate well the authors' claims regarding the composition of the crystals.
2. Figure 6: the y axis of sections a and b should be the same scale.
3. Table 2: it would be conventional to perform statistical tests on the difference in rates, though they would appear to be clearly different between the fourth and the others; what about between 1 and 2?

Discussion:
1. page 9: the authors attribute the usual inhibitory effect of citrate to "complexation of calcium", but there is also evidence that citrate has an effect at crystal surfaces to inhibit growth and aggregation, independent of calcium concentration.

Minor Essential Revisions (such as missing labels on figures, or the wrong use of a term, which the author can be trusted to correct)
1. Abstract, background: "the regrowth of COD real (or RENAL?) spontaneously passed..."

Discretionary Revisions (which the author can choose to ignore)

**What next?:** Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** No

**Declaration of competing interests:**

I declare that I have no competing interests