The Treatment of Stone Disease in the Aging Population: How Old Is Too Old for Stone Removal?

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Approximately 16% of Americans are elderly, which is traditionally defined as age 65 years or older. As life expectancy has increased, so has the percentage of elderly surgical patients, who now account for 40% of all patients undergoing surgery. The incidence of nephrolithiasis in the elderly is also growing, with studies showing 16% of patients with nephrolithiasis are older than age 60 years. Furthermore, while the literature is still evolving, it is becoming apparent that nephrolithiasis in the elderly (>65 years) is a unique disease, and not simply an extension of nephrolithiasis seen in younger patients.

Compared to their younger counterparts, elderly patients with nephrolithiasis are more likely to present with atypical symptoms such as gastrointestinal symptoms, atypical pain or no pain, urinary tract infection (UTI) or fever. They are also more likely to be hospitalized for evaluation, and present with larger stones or staghorn calculi. Elderly patients have a greater proportion of uric acid and atypical stone composition. Furthermore, they are less likely to spontaneously pass their stone when having a stone event, resulting in a higher likelihood of requiring surgical intervention.

While elderly patients are more likely to require surgical intervention, urologists may hesitate to perform it, as surgery poses a risk for complications and adverse outcomes. As patients age, they often have more comorbidities, take more medications and have less functional reserve. General surgery literature has shown that postoperative mortality, morbidity and complications increase with increasing age. However, the same trend has not been seen in endourology. While limited to retrospective chart review and population-based data, surgical intervention for stones has been shown to be safe and effective, even in octogenarians.

Cakici et al performed a retrospective comparative study of 1,750 patients who underwent retrograde flexible ureteroscopy (URS) at their institution. The elderly group (>60 years) had a greater proportion of female patients (45% vs 33%), a higher body mass index (BMI), more comorbidities and a larger mean stone size compared to younger patients (p <0.001 for all). While elderly patients had a significantly longer operative time than younger patients (49 vs 45 minutes, p <0.001), there were no significant differences in length of stay, stone-free rates or complications. Pratley et al reported 5-year outcomes after URS in patients ≥70 years. With a mean age of 77 years, their study found URS to be safe and effective, with a final stone-free rate of 97% and a complication rate of 9% (mainly Clavien I/II). Furthermore, 73% of cases were same-day surgeries, and of the patients who required admission 89% were discharged within 24 hours. Similar results have been published in other studies, confirming the safety and efficacy of URS in elderly patients.

Percutaneous nephrolithotomy (PCNL), a more invasive surgical procedure than URS, may be considered higher risk for elderly patients, given the greater chance of complications such as acute blood loss and hydrothorax, and the potential for injury due to prone positioning. Morganstern et al reported their case series of patients >80 years who underwent PCNL. While the octogenarians had higher comorbidities, higher rates of UTIs and worse renal function at baseline compared to patients <65 years, there were no significant differences in operative time, stone-free status, length of stay or complication rates. Abedali et al found that patients >80 years had higher complication rates, higher transfusion rates and longer hospital stays compared to younger patients. However, there were no significant differences in mortality or perioperative outcomes in patients aged 60 to 79 years compared to those <60 years. Other studies report their success with PCNL in the elderly (>65 years) with similar outcomes to their younger counterparts. While data are limited, the evidence suggests that URS and PCNL are safe and effective surgical procedures for stones in the elderly, although patients >80 years old should be counselled that they may be at higher risk for transfusion and complications.

Urologists may be inclined to offer shock wave lithotripsy (SWL) to elderly patients as it is the least invasive surgical treatment option for stones. However, SWL requires patients to pass their stone fragments. Elderly patients are less likely to spontaneously pass stone fragments and are more likely to have positive preoperative urine cultures. Therefore, these patients may have lower stone-free rates and higher risk of complications compared to younger patients undergoing SWL. Abdel-Khalek et al reported on SWL outcomes in 2,954 patients and observed that in multivariate analysis age >40 years was a predictor of SWL failure. Furthermore, as there is a higher proportion of uric acid stones in the elderly due to metabolic rearrangements, SWL with fluoroscopy would not be an option for a greater proportion of individuals.

Limitations of retrospective data notwithstanding, the literature supports that surgical treatment of nephrolithiasis can be safely offered to the elderly. Elderly patients may be more likely to require surgery than their younger counterparts as they are less likely to pass their stones spontaneously and tend to present with larger stone burdens. In order to maximize safety and minimize adverse surgical outcomes, we recommend: 1) appropriate preoperative clearance and optimization of medical conditions when possible, 2) having a lower threshold to offer treatment up-front as increasing age and comorbidity may make surgery more difficult in the future, 3) considering offering URS and/or PCNL over SWL when appropriate as data suggest lower stone-free rates and higher reintervention rates in elderly patients who undergo SWL, and 4) if a patient is admitted postoperatively, considering methods of minimizing risks of delirium and sundowning, encouraging safe early ambulation, and having a low threshold to initiate a multidisciplinary approach to prevent deconditioning and aid in prompt discharge.