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The Role of Active Surveillance in the Management of Asymptomatic Non-Obstructing Renal Stones: A Narrative Review

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Abstract **Review Article**

The increasing use of abdominal imaging has led to a growing detection of asymptomatic renal stones, creating an important management dilemma between prophylactic intervention and conservative follow-up. Active surveillance has progressively emerged as a valid strategy for selected patients with asymptomatic, non-obstructing renal calculi, particularly when stone burden is limited and the risk of progression appears low. Current French, European, and American urological guidelines all recognize active surveillance as an acceptable option in carefully selected cases. Observational studies suggest that many asymptomatic renal stones remain silent over time, yet a substantial proportion may enlarge, become symptomatic, migrate, or ultimately require intervention. More recent comparative studies indicate that prophylactic treatment may reduce future stone-related events in some clinical contexts, especially when small asymptomatic stones are encountered during surgery already being performed for another indication. The available evidence therefore supports a risk-adapted and patient-centered approach rather than systematic treatment or indiscriminate observation. Active surveillance should not be regarded as therapeutic inaction, but as a structured management strategy requiring appropriate patient selection, periodic imaging, and shared decision-making. This narrative review examines the current evidence supporting active surveillance in asymptomatic non-obstructing renal stones, discusses its clinical rationale and limitations, and highlights the situations in which conservative management appears most appropriate.

Keywords: Urolithiasis, Asymptomatic Renal Stones, Active Surveillance, Conservative Management, Prophylactic Treatment, Narrative Review.

INTRODUCTION

Urinary stone disease is a common and recurrent disorder with a substantial impact on patient quality of life and healthcare resources. Historically, the clinical focus of stone management centered on symptomatic, obstructive, or infected calculi. However, the broader use of ultrasonography and computed tomography for unrelated abdominal complaints has changed this landscape by increasing the incidental detection of asymptomatic renal stones. As a result, urologists are increasingly required to decide whether a non-obstructing stone discovered in an otherwise asymptomatic patient should be treated pre-emptively or followed conservatively.

This question has become more relevant because asymptomatic renal stones do not all share the same natural history. Some remain stable for years, some increase in size, and others eventually produce pain, infection, obstruction, or the need for delayed intervention. The challenge is therefore not simply to remove a stone, but to identify which stones carry sufficient risk to justify treatment and which may be safely monitored. In this setting, active surveillance has emerged as a clinically meaningful option. In stone disease, active surveillance implies an intentional decision to defer intervention while maintaining structured clinical and imaging follow-up, with a clear plan to intervene if progression occurs.

The major urological guidelines now support this approach in selected patients. French AFU/CLAFU recommendations state that renal stones may be observed in the absence of symptoms, threatening features, or clear risk of complications. The European Association of Urology similarly supports observation for selected small asymptomatic calyceal stones, whereas the

American Urological Association states that clinicians may offer either active surveillance or pre-emptive surgical management for asymptomatic non-obstructing kidney stones. This convergence among major societies reflects a broader recognition that immediate intervention is not mandatory in every patient and that conservative management may be appropriate when the anticipated risk of progression is low.

The purpose of this narrative review is to examine the role of active surveillance in the management of asymptomatic non-obstructing renal stones, to summarize the available evidence on stone-related outcomes during follow-up, and to discuss the factors that should guide the choice between surveillance and prophylactic treatment.

Materials and Methods

This narrative review was based on current guideline documents and key clinical studies addressing the natural history and management of asymptomatic non-obstructing renal stones. The principal framework was derived from the recommendations of the French Lithiasis Committee of the Association Française d'Urologie, the European Association of Urology guidelines on urolithiasis, and the American Urological Association guideline on the surgical management of kidney and ureteral stones. These documents were selected because they represent the most relevant contemporary syntheses of evidence and expert consensus on this topic.

The guideline material was supplemented by the main observational studies, systematic reviews, and comparative analyses most frequently cited in the literature on active surveillance. Particular attention was paid to the cohort study by Dropkin *et al*., on the natural history of asymptomatic non-obstructing renal stones managed conservatively, the systematic review by Geraghty *et al.,* on long-term outcomes of small asymptomatic and residual stones, the review on the durability of active surveillance, the study by Kanno *et al*., focusing on stones measuring 5 mm or less, the retrospective cohort by Wu *et al*., comparing prophylactic intervention with surveillance, and the randomized trial by Sorensen *et al*., evaluating the removal of small asymptomatic stones encountered during endoscopic surgery performed for another stone-related indication.

The objective of the present review was not to perform a formal meta-analysis, but to provide a clinically coherent and publication-oriented synthesis of the available evidence, with emphasis on patient selection, expected outcomes during follow-up, and the practical implications of choosing surveillance instead of immediate intervention.

Discussion

The main rationale for active surveillance lies in the fact that not all asymptomatic renal stones become clinically relevant. A strategy of routine prophylactic treatment for every incidentally detected renal stone would expose many patients to intervention without clear evidence of benefit. Conservative management may avoid unnecessary procedures, reduce treatment-related morbidity, limit stent-related discomfort, and preserve quality of life while maintaining patient safety in carefully selected cases. This concept is now reflected in the major urological guidelines, which all recognize that active surveillance is an acceptable option for asymptomatic non-obstructing renal stones in selected circumstances.

Natural-history data strongly support this position. The French AFU/CLAFU recommendations, drawing on the available literature, report wide but clinically informative ranges for outcomes during surveillance, including spontaneous passage rates of 3% to 29%, symptom development rates of 7% to 77%, stone growth rates of 5% to 66%, and secondary intervention rates of 7% to 26%. Although these ranges are broad, largely because of heterogeneity in study populations and follow-up protocols, they clearly show that many asymptomatic stones remain stable over time and that immediate treatment is not systematically required. At the same time, they also indicate that surveillance is not risk-free and that a meaningful minority of patients will eventually experience clinical progression.

Among the most influential studies in this field, the cohort reported by Dropkin and colleagues remains especially important. In patients with asymptomatic non-obstructing renal stones managed with active surveillance, most calculi remained asymptomatic over several years of follow-up. Fewer than one-third of patients developed symptoms, fewer than one-fifth required surgery because of pain, and a small proportion passed stones spontaneously. Importantly, the study also documented silent obstruction in a minority of patients. This finding has major clinical significance because it demonstrates that purely symptom-based follow-up is inadequate. Imaging surveillance is therefore an essential component of conservative management. The same study also suggested that lower-pole stones are less likely to become symptomatic and less likely to pass spontaneously, a finding that supports their inclusion among the most suitable targets for surveillance when other risk factors are absent.

More recent studies have refined the prognostic importance of stone size and stone burden. The systematic review by Geraghty *et al.,* found that the likelihood of subsequent intervention rises with increasing stone size, especially beyond 5 mm and even more clearly beyond 10 mm. Kanno *et al*., similarly reported that stones measuring 5 mm or less generally have a more favorable course than larger stones,

although stone-related events are not completely absent in this subgroup. These findings help explain why guideline recommendations are particularly favorable toward surveillance for small lower-pole stones and why follow-up intervals may be adjusted according to stone size and evolution.

Patient selection remains the most critical determinant of successful active surveillance. The ideal candidate is asymptomatic, has a non-obstructing and non-infected renal stone of limited burden, has no major anatomical or functional risk factor, and is able to comply with longitudinal follow-up. Lower-pole location and small stone size are often regarded as reassuring features. By contrast, surveillance becomes less attractive when there is documented stone growth, recurrent infection, a solitary kidney, high-risk occupational exposure, limited access to emergency care, or poor adherence to follow-up. Patient preference also plays an important role. Some individuals are comfortable with surveillance once the natural history and follow-up plan are clearly explained, whereas others experience significant anxiety knowing that a stone remains untreated. Shared decision-making is therefore indispensable.

One of the major limitations of active surveillance is the imperfect predictability of individual stone behavior. Population-based studies provide risk estimates, but they do not yet allow precise individualized forecasting of which stone will remain silent and which will progress. This uncertainty is one reason why surveillance should not be interpreted as passivity. Instead, it should be viewed as a structured therapeutic choice, requiring explicit counseling, regular reassessment, and timely escalation to active treatment when clinical or radiological thresholds are reached.

The comparison between surveillance and prophylactic treatment remains complex. Retrospective comparative data from Wu *et al.,* suggest that prophylactic intervention may reduce future stone-related events and subsequent procedures in selected patients, although this benefit comes at the cost of treatment-related morbidity, which was generally minor in the reported series. However, because retrospective designs are vulnerable to selection bias, these findings do not justify universal pre-emptive treatment. Rather, they suggest that a preventive strategy may be reasonable in subsets of patients at higher risk of future events.

The randomized trial by Sorensen *et al*., provides important additional insight. In patients already undergoing endoscopic treatment for another symptomatic or clinically significant stone, removal of additional small asymptomatic renal stones reduced future relapse compared with leaving those stones in place. This trial should be interpreted carefully. It does not establish that every incidental asymptomatic renal stone warrants treatment. Instead, it shows that when surgical access is already available for another indication, concomitant removal of small asymptomatic stones can reduce later stone-related events. This is an argument for opportunistic treatment in a favorable operative setting rather than a rejection of active surveillance as a first-line strategy.

Taken together, the current evidence does not support either systematic prophylactic intervention or indiscriminate observation. It instead favors a risk-adapted and patient-centered approach. Active surveillance appears most justified when the risk of progression is low and the immediate burden of intervention is disproportionate. Conversely, prophylactic treatment becomes more attractive when risk factors for progression are present, when follow-up is unreliable, when infection or anatomical concern exists, or when an operative opportunity already exists.

The literature nevertheless remains limited by methodological heterogeneity. Most studies are retrospective, single-center, and based on relatively small cohorts. Follow-up schedules, imaging modalities, and definitions of progression differ substantially across reports. In addition, some studies combine primary asymptomatic stones with postoperative residual fragments, which complicates interpretation. These limitations explain why contemporary guideline recommendations remain cautious and why higher-quality prospective studies are still needed.

CONCLUSION

Active surveillance has become an established component of the management of asymptomatic non-obstructing renal stones. Its principal value lies in avoiding overtreatment in patients whose stones may remain clinically silent for prolonged periods while preserving the possibility of delayed intervention if progression occurs. Current French, European, and American guidelines all support this approach in selected patients, especially when stones are small, lower-pole, non-infected, and incidentally detected.

However, active surveillance should never be confused with neglect. It requires careful patient selection, structured imaging follow-up, clear counseling regarding the risks of growth, symptoms, obstruction, and future intervention, and a well-defined plan for treatment escalation if the clinical situation changes. The most appropriate management of asymptomatic renal stones is therefore not ideological but individualized. Future research should focus on improving risk stratification so that clinicians can better identify which patients can be safely observed and which are more likely to benefit from early intervention.

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