

Short Communication

Evaluation of the Efficacy and Complications of Retrograde Intrarenal Surgery (RIRS)

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ABSTRACT

Retrograde intrarenal surgery (RIRS) is one of the modern minimally invasive endoscopic techniques used in the treatment of nephrolithiasis. The aim of this study was to evaluate the clinical efficacy and postoperative complications of the RIRS procedure.

A total of 50 patients who underwent RIRS were included in the study. The patients were aged between 55 and 65 years. Among them, 28 were males and 22 were females. The average stone size was greater than 1.5 cm, with a density ranging from 1000 to 1200 HU. All procedures were performed under general anesthesia. A flexible ureteroscope and holmium laser were used during surgery. The average operative time ranged from 1.5 to 2 hours. The study demonstrated a 100% stone-free rate. The overall postoperative complication rate was 8%. According to the Traxer (PULS) classification, no ureteral injury (Grade 0) was detected in 98% of cases, while minor Grade 1 ureteral injury was observed in 2% of patients.

The results indicate that RIRS is a highly effective and safe method for the treatment of nephrolithiasis.

Keywords: RIRS; Nephrolithiasis; Ureteroscop; Kidney Stones; Endourology; Traxer (PULS) Classification

Introduction

Nephrolithiasis is one of the most common diseases in modern urology [1,3]. In recent years, minimally invasive methods for the treatment of kidney stones have developed rapidly. Among these, retrograde intrarenal surgery (RIRS) has become

widely used due to its high efficacy and safety [2,5]. RIRS is an endoscopic procedure performed through the natural urinary tract. The method is characterized by minimal surgical trauma, a short postoperative recovery period, and favorable clinical outcomes.

Materials and Methods

The study was conducted in the Department of Urology at the East Kazakhstan Regional Specialized Medical Center. A total of 50 patients who underwent RIRS were included in the study. Among them, 28 were male and 22 were female. The patients were aged between 55 and 65 years. According to computed tomography findings, the average stone size was greater than 1.5 cm. Stone density ranged from 1000 to

1200 HU. All procedures were performed under general anesthesia. A flexible ureteroscope, ureteral access sheath, and holmium laser were used during surgery [4,6]. The average operative time ranged from 1.5 to 2 hours. At the end of the procedure, ureteral stents were placed to ensure complete and unobstructed passage of fragmented stone debris. The average duration of hospitalization was 2-3 days.

Results

The study demonstrated a 100% stone-free rate. The overall postoperative complication rate was 8%. According to the Traxer (PULS) classification, Grade 0 ureteral injury was identified in 98% of cases, while Grade 1 injury was observed in 2% of patients [4].

The recorded complications included:

- Acute prostatitis — 2%;
- Acute epididymitis — 2%;
- Acute pyelonephritis — 2%;
- Upper ureteral injury — 2%.

COMPLICATIONS AFTER RIRS SURGERY

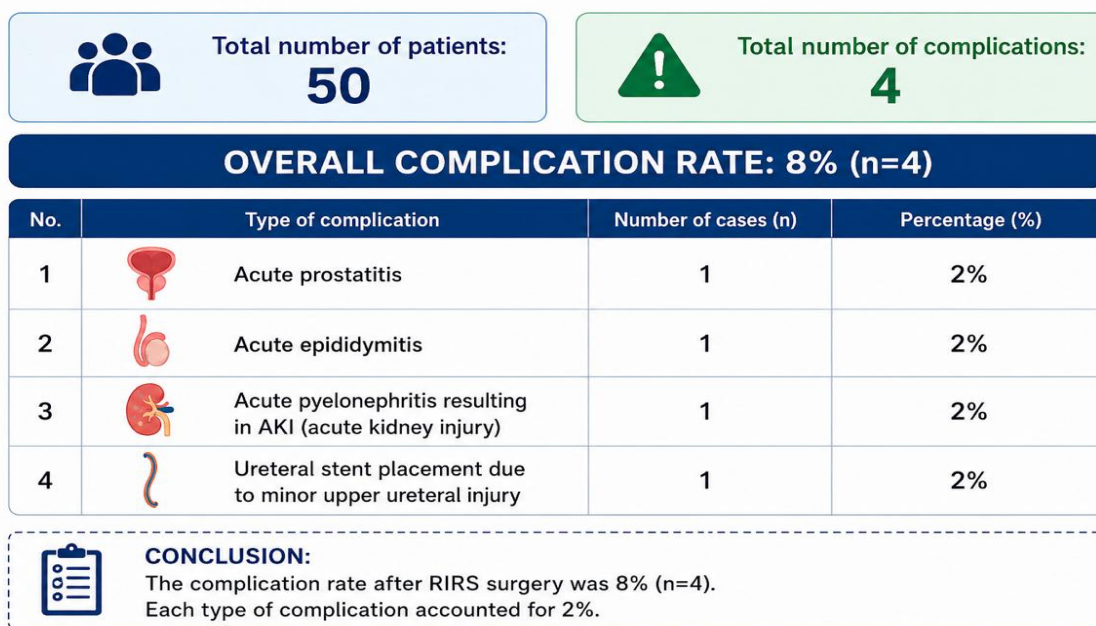


Figure 1. Types and incidence of complications following retrograde intrarenal surgery (RIRS).

Due to mild upper ureteral injury, one patient required ureteral stent placement.

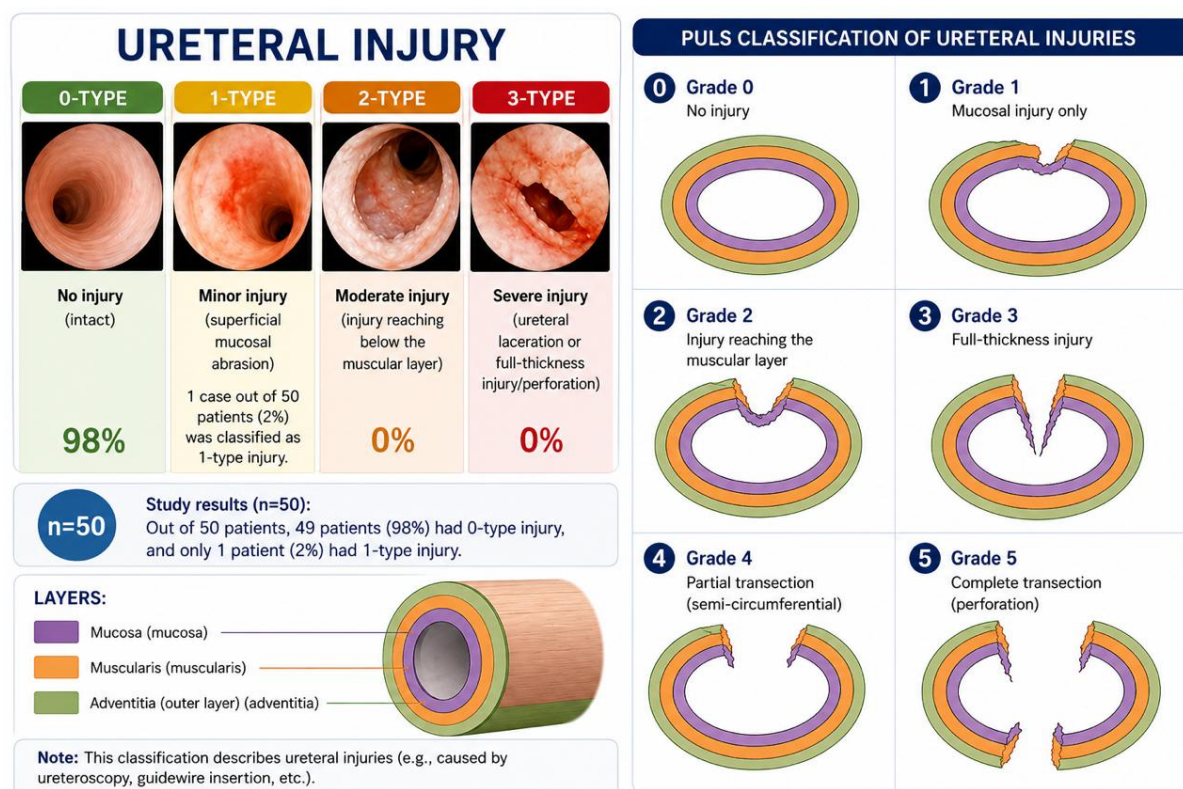


Figure 2. Traxer and Thomas Post-Ureteroscopic Lesion Scale (PULS) Classification and Distribution of Ureteral Injury Grades

Discussion

The obtained results demonstrated the high efficacy of RIRS in the treatment of nephrolithiasis. The high stone-free rate confirms the clinical effectiveness of the procedure. The absence of severe ureteral injuries according to the Traxer (PULS) classification indicates a

high level of procedural safety. The study findings are consistent with international literature data and the recommendations of the European Association of Urology (EAU) guidelines [1,3].

Conclusion

Based on the analysis of retrograde intrarenal surgeries, 50 patients underwent the procedure within one year. The overall complication rate was 8%, indicating that this method is relatively safe. The distribution of recorded complications was as follows: acute pyelonephritis, acute prostatitis, acute epididymitis, and ureteral stenting due to a minor injury of the upper ureter. Each complication occurred in 2% of cases. Retrograde intrarenal surgery (RIRS) is one of the effective and safe minimally invasive surgical techniques for the treatment of nephrolithiasis. The study results demonstrated the high clinical efficacy of the RIRS method. A 100% stone-free rate proves the high success of the surgery. The low rate of postoperative complications indicated the reliability and good tolerability of the RIRS method. RIRS is an effective endoscopic technique that can be widely used in urological practice for the treatment of high-density and complexly located kidney stones. Retrograde intrarenal surgery (RIRS) is one of the effective and safe

minimally invasive surgical methods for the treatment of nephrolithiasis. The study results demonstrated the high clinical efficacy of the RIRS method. A 100% stone-free rate confirmed the high effectiveness of the procedure. The low frequency of postoperative complications demonstrated the reliability and good tolerability of RIRS. RIRS is an effective endoscopic method that can be widely used in urological practice for the treatment of high-density and complexly located renal stones [1,7-9].

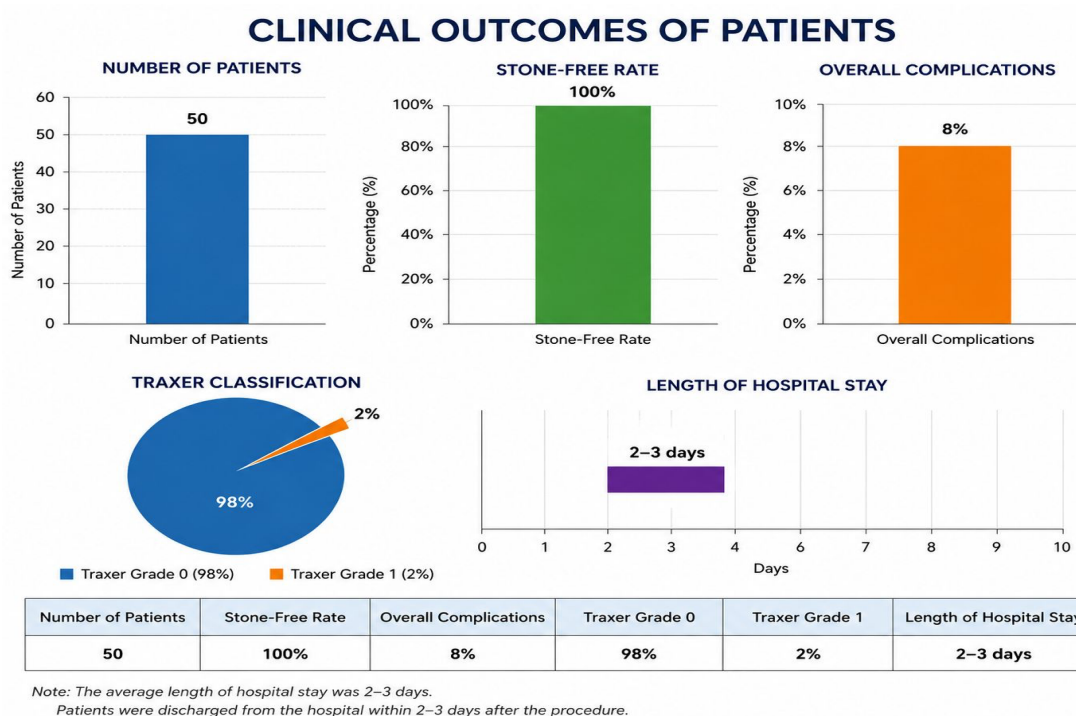


Figure 3. Clinical Outcomes Following Retrograde Intrarenal Surgery: Stone-Free Rate, Overall Complications, Traxer Classification, and Length of Hospital Stay.

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