

Clinical Efficacy of Xiaochengqi Decoction Enema Combined with Conventional Therapy in Patients with Acute Simple Intestinal Obstruction

Xiujuan Guo^{1*†}, Hongfei Deng^{2†}, Yanheng Zhang³, Zhongjian Li⁴

¹Department of Emergency Medicine, Linfen People's Hospital, Linfen 041000, Shanxi, China

²Graduate School, Changzhi Medical College, Changzhi 046000, Shanxi, China

³Department of Medical Imaging, Linfen People's Hospital, Linfen 041000, Shanxi, China

⁴Department of Acupuncture, Linfen People's Hospital, Linfen 041000, Shanxi, China

†These authors contributed equally to this work and share the first authorship

*Corresponding author: Xiujuan Guo, 516257626@qq.com

Copyright: © 2026 Author(s). This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0), permitting distribution and reproduction in any medium, provided the original work is cited.

Abstract: *Objective:* To evaluate the clinical efficacy of Xiaochengqi Decoction enema in the treatment of acute simple intestinal obstruction and to compare its effects with those of Gastrografin and soap water enema. *Methods:* This study was designed as a prospective randomized controlled study. A total of 150 patients diagnosed with acute simple intestinal obstruction and admitted to the Emergency Department of Linfen People's Hospital between September 2023 and August 2025 were enrolled. Patients were randomly assigned into the Xiaochengqi Decoction group, the Gastrografin group, and the soap water group, with 50 patients in each group. All groups received conventional conservative management, including fasting, continuous gastrointestinal decompression, fluid resuscitation, and correction of water–electrolyte and acid–base imbalances. In addition, patients in the Xiaochengqi Decoction group received modified Xiaochengqi Decoction retention enema, those in the Gastrografin group received 76% Gastrografin via nasogastric tube, and those in the soap water group received soap water enema. Clinical efficacy, symptom relief time, length of hospital stays, and imaging improvement were compared among the three groups. *Results:* No statistically significant differences were observed among the three groups in baseline characteristics ($p > 0.05$). No statistically significant difference in overall clinical efficacy was observed among the groups ($\chi^2 = 6.036$, $P = 0.196$). The total effective rate was highest in the Xiaochengqi Decoction group (90.0%), followed by the Gastrografin group (86.0%) and the soap water group (76.0%). Significant differences were also identified in abdominal pain relief time, time to first flatus, time to first defecation, and length of hospital stay (all $p < 0.001$), with the shortest durations observed in the Xiaochengqi Decoction group. Imaging improvement rates differed significantly among groups ($\chi^2 = 11.836$, $P = 0.019$), with the highest rate in the Xiaochengqi Decoction group (98.0%). *Conclusion:* Xiaochengqi Decoction enema, when combined with conventional conservative therapy, may improve clinical outcomes in patients with acute simple intestinal obstruction, promote recovery of bowel function, and reduce hospital stay, demonstrating favorable clinical applicability.

Keywords: Xiaochengqi decoction; Simple intestinal obstruction; Enema therapy; Emergency medicine; Clinical efficacy

Online publication: Apr 5, 2026

1. Introduction

Acute simple intestinal obstruction is a common clinical condition encountered in emergency departments and represents an important subtype of mechanical intestinal obstruction ^[1]. It is characterized by impaired intestinal transit without evidence of compromised bowel wall perfusion ^[2]. Patients typically present with abdominal pain, abdominal distension, nausea, vomiting, and cessation of flatus or defecation. If not managed appropriately, the condition may progress to strangulated obstruction or bowel necrosis, which can lead to severe morbidity and mortality ^[3].

Conservative management remains the primary therapeutic strategy for acute simple intestinal obstruction and generally includes fasting, gastrointestinal decompression, fluid resuscitation, and correction of water–electrolyte disturbances ^[4]. Enema therapy is frequently used as an adjunctive intervention to relieve intraluminal pressure and facilitate intestinal decompression. Traditional soap water enema mainly exerts a lubricating effect and may provide limited therapeutic benefit. Gastrografin, a hyperosmolar water-soluble contrast agent, has been reported to promote fluid shifts into the intestinal lumen and stimulate bowel motility; however, its therapeutic efficacy in emergency settings remains controversial ^[5].

Xiaochengqi Decoction, a classical traditional Chinese medicine formulation, has been widely used for gastrointestinal disorders and is believed to exert regulatory effects on intestinal motility ^[6,7]. In recent years, herbal retention enema has gained increasing attention as a complementary approach in the management of intestinal obstruction, yet comparative clinical evidence remains insufficient. Therefore, the present study employed a randomized controlled design to evaluate the clinical efficacy of Xiaochengqi Decoction enema and to compare its effects with those of Gastrografin and soap water enema.

2. Methods

2.1. Study population

A total of 150 patients diagnosed with acute simple intestinal obstruction and admitted to the Emergency Department of Linfen People's Hospital between September 2023 and August 2025 were enrolled in this study. All patients met the diagnostic criteria for acute simple intestinal obstruction, including abdominal pain, abdominal distension, and cessation of flatus or defecation, without signs of peritoneal irritation on physical examination ^[8]. Abdominal radiography demonstrated the presence of air–fluid levels. All participants provided written informed consent prior to inclusion.

2.2. Randomization and grouping

Patients were randomly assigned using a random number table into three groups: the Xiaochengqi Decoction group, the Gastrografin group, and the soap water group, with 50 patients in each group. No statistically significant differences were observed among the groups with respect to baseline characteristics, including age, sex, disease duration, and abdominal pain visual analogue scale (VAS) scores ($p > 0.05$).

2.3. Treatment protocol

All patients received conventional conservative management upon admission, including fasting, continuous gastrointestinal decompression, fluid resuscitation, and correction of water–electrolyte disturbances. In addition, group-specific interventions were administered as follows:

- (1) Xiaochengqi Decoction group
Modified Xiaochengqi Decoction retention enema twice daily;
- (2) Gastrografin group
Administration of 76% Gastrografin (100 mL) via nasogastric tube twice daily;
- (3) Soap water group
Soap water enema (700 mL) twice daily

Patients were treated and observed for up to 10 days or until clinical resolution of obstruction. Clinical efficacy, abdominal pain relief time, time to first flatus, time to first defecation, length of hospital stay, and imaging improvement were recorded and analyzed. Clinical outcomes were categorized as cured, improved, or ineffective. Cured was defined as complete resolution of abdominal symptoms with disappearance of air–fluid levels on imaging; Improved was defined as partial symptom relief with radiological improvement; Ineffective indicated no clinical improvement or clinical deterioration requiring surgical intervention. The total effective rate was calculated as:

$$\text{Total effective rate} = (\text{cured} + \text{improved cases}) / \text{total cases} \times 100\%.$$

2.4. Statistical analysis

Statistical analyses were performed using SPSS version 27.0. Normally distributed continuous variables are presented as mean $\pm$ standard deviation (SD), with overall intergroup comparisons conducted using one-way analysis of variance (ANOVA), and pairwise post-hoc comparisons were performed via the Bonferroni test. Non-normally distributed continuous variables are expressed as median (interquartile range), and the Kruskal-Wallis (KW) H test was adopted for overall between-group comparisons. Categorical variables were analyzed using the chi-square (χ^2) test. Values marked with distinct lowercase superscript letters (a, b, c) within the same row denote statistically significant intergroup differences after Bonferroni pairwise comparison. A two-tailed P value < 0.05 was considered statistically significant.

3. Results

3.1. Baseline characteristics

No statistically significant differences were observed among the age, sex distribution, disease duration, and abdominal pain severity (all $p > 0.05$), indicating that the groups were comparable at baseline (Table 1).

Table 1. Comparison of baseline characteristics among the three groups

Variables	Xiaochengqi Decoction group (n = 50)	Gastrografin group (n = 50)	Soap water group (n = 50)	F/χ^2 value	p value
Age (years)	53.6 $\pm$ 11.2	55.1 $\pm$ 10.8	54.3 $\pm$ 12.1	0.217	0.805
Sex (male/female)	28/22	26/24	29/21	0.378	0.828
Disease duration (h)	19.2 $\pm$ 6.8	20.5 $\pm$ 7.4	18.9 $\pm$ 6.5	0.790	0.456
Abdominal pain VAS score	8 (7, 8)	8 (7, 9)	8 (7, 8)	1.023	0.600

Note: Continuous variables are presented as mean $\pm$ standard deviation (SD) and were compared using one-way analysis of variance (ANOVA). Categorical variables were compared using the chi-square (χ^2) test. A p value < 0.05 was considered statistically significant.

3.2. Clinical efficacy

No statistically significant difference in clinical efficacy distribution was observed among the three groups ($\chi^2 = 6.036$, $P = 0.196$). Overall, the Xiaochengqi Decoction group demonstrated the highest therapeutic response, followed by the Gastrografin group and the soap water group. Detailed results are presented in **Table 2**, and comparisons of total effective rates are shown in **Figure 1**.

Table 2. Comparison of clinical efficacy among the three groups

Groups	Cured	Improved	Ineffective	Total effective rate
Xiaochengqi Decoction group (n = 50)	33 (66.0%)	12 (24.0%)	5 (10.0%)	45 (90.0%)
Gastrografin group (n = 50)	29 (58.0%)	14 (28.0%)	7 (14.0%)	43 (86.0%)
Soap water group (n = 50)	22 (44.0%)	16 (32.0%)	12 (24.0%)	38 (76.0%)

Note: Total effective rate = (cured + improved cases) / total cases $\times$ 100%. Group comparisons were performed using the chi-square (χ^2) test.

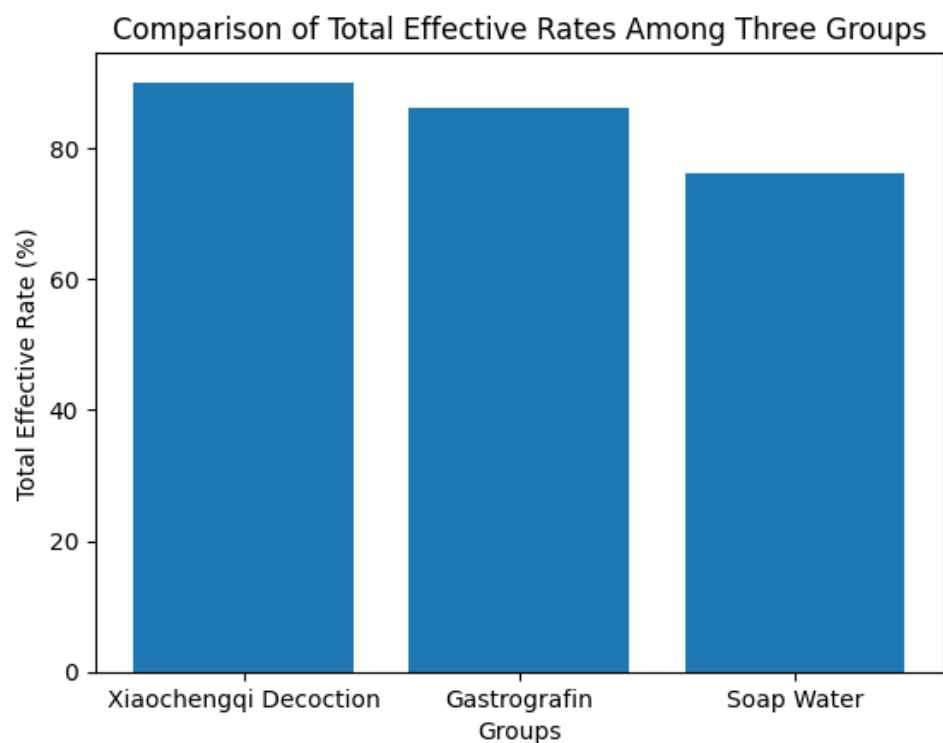


Figure 1. Comparison of total effective rates among the three groups.

Note: Total effective rate = (cured + improved cases)/total cases $\times$ 100%. The difference among groups was not statistically significant ($\chi^2 = 6.036$, $P = 0.196$).

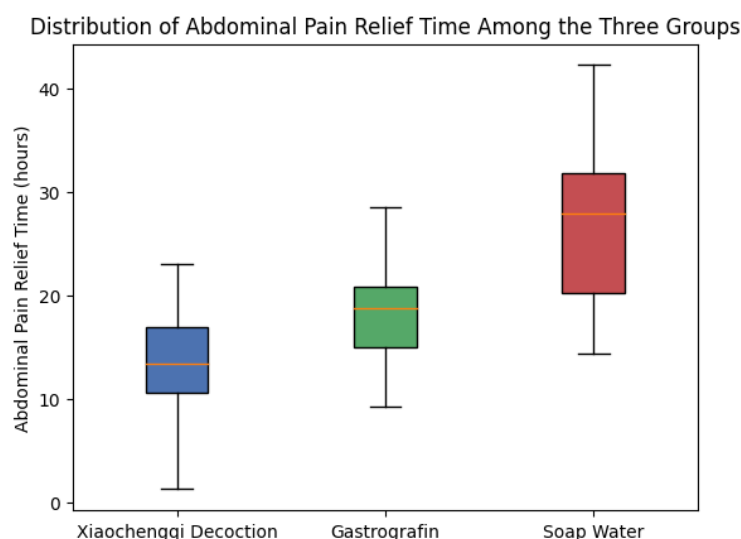
3.3. Symptom relief and hospital stay

One-way analysis of variance (ANOVA) revealed statistically significant differences among the three groups in abdominal pain relief time, time to first flatus, time to first defecation, and length of hospital stay (all $p < 0.001$). Overall, the Xiaochengqi Decoction group exhibited the shortest durations, followed by the Gastrografin group and the soap water group (**Table 3**). The distribution of abdominal pain relief time is illustrated in **Figure 2**.

Table 3. Comparison of symptom relief time and length of hospital stay among the three groups

Variables	Xiaochengqi Decoction group	Gastrografin group	Soap water group	<i>F</i> value	<i>p</i> value
Abdominal pain relief time (h)	12.8 ± 4.5 ^a	18.5 ± 5.3 ^b	25.1 ± 7.2 ^c	54.416	< 0.001
Time to first flatus (h)	18.5 ± 5.2 ^a	25.2 ± 6.5 ^b	31.8 ± 8.4 ^c	48.682	< 0.001
Time to first defecation (h)	27.1 ± 7.3 ^a	35.4 ± 8.9 ^b	42.6 ± 10.7 ^c	36.527	< 0.001
Length of hospital stay (d)	5.5 ± 1.4 ^a	6.9 ± 1.7 ^b	7.8 ± 2.0 ^c	25.619	< 0.001
Abdominal distension score on Day 2	4 (3, 4)	4 (3, 5)	4 (4, 5)	5.744	0.057

Note: Normally distributed continuous variables were expressed as mean ± standard deviation, with intergroup overall comparisons conducted by one-way analysis of variance (ANOVA), and pairwise post-hoc comparisons were performed using the Bonferroni method; non-normally distributed continuous variables were presented as median (interquartile range), and the Kruskal-Wallis (KW) H test was used for between-group overall comparisons. A two-tailed *P* value < 0.05 indicated statistically significant difference. Values with different lowercase superscript letters (a, b, c) in the same row were significantly different after pairwise Bonferroni comparison.

**Figure 2.** Distribution of abdominal pain relief time among the three groups.

Note: Data are presented as mean ± standard deviation. Differences among groups were statistically significant (*p* < 0.001).

3.4. Imaging outcomes

A statistically significant difference in imaging improvement was observed among the three groups ($\chi^2 = 11.836$, *P* = 0.019). The Xiaochengqi Decoction group demonstrated the highest imaging improvement rate, followed by the Gastrografin group and the soap water group (Table 4 and Figure 3).

Table 4. Comparison of imaging improvement among the three groups

Groups	Disappearance of air–fluid levels	Reduction of air–fluid levels	No change or worsening	Improvement rate
Xiaochengqi Decoction group (n = 50)	33 (66.0%)	16 (32.0%)	1 (2.0%)	49 (98.0%)
Gastrografin group (n = 50)	29 (58.0%)	15 (30.0%)	6 (12.0%)	44 (88.0%)
Soap water group (n = 50)	22 (44.0%)	16 (32.0%)	12 (24.0%)	38 (76.0%)

Note: Improvement rate = (disappearance + reduction of air–fluid levels)/total cases × 100%. Group comparisons were performed using the chi-square (χ^2) test.

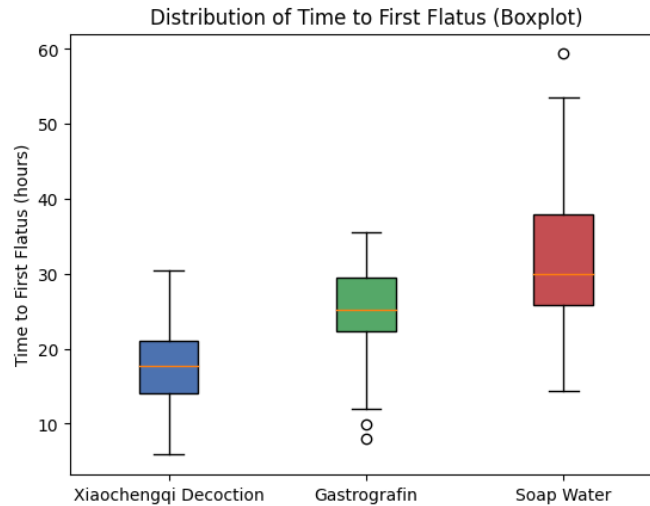


Figure 3. Distribution of time to first flatus among the three groups.

Note: Data are presented as mean $\pm$ standard deviation. Differences among groups were statistically significant ($p < 0.001$).

4. Discussion

Acute simple intestinal obstruction is a frequently encountered condition in emergency departments. Its key pathophysiological characteristic is impaired intestinal transit without evident compromise of bowel wall perfusion. Early and appropriate conservative management is therefore essential, as many patients may achieve favorable outcomes without surgical intervention ^[3]. The identification of safe and effective adjunctive therapies remains clinically important.

In the present randomized controlled study, three commonly used therapeutic approaches were compared: Xiaochengqi Decoction retention enema, Gastrografin administration, and soap water enema. Baseline characteristics were comparable among the groups, supporting the validity of subsequent efficacy comparisons.

With respect to overall clinical efficacy, the Xiaochengqi Decoction group exhibited the numerically highest response rate. Soap water enema, although traditionally used, primarily provides lubrication and mechanical stimulation and may exert limited influence on intestinal motility. Gastrografin, a hyperosmolar water-soluble contrast agent, has been reported to promote intraluminal fluid shifts and stimulate bowel activity through osmotic mechanisms ^[5,9]. However, its therapeutic role remains debated, with varying results reported across studies ^[9,10]. The findings of the present study suggest a trend indicate that the efficacy of Gastrografin was intermediate between Xiaochengqi Decoction enema and soap water enema, which is broadly consistent with previous clinical observations ^[4].

Time-related clinical outcomes are particularly relevant in the management of intestinal obstruction. In this study, abdominal pain relief time, time to first flatus, and time to first defecation were shorter in the Xiaochengqi Decoction group. Time to first flatus is widely regarded as an objective indicator of bowel function recovery, and reductions in this parameter may reflect improved gastrointestinal motility ^[11,12]. The favorable outcomes observed in the herbal enema group may be related to the combined pharmacological properties of its components. Pharmacological studies suggest that Xiaochengqi Decoction may influence gastrointestinal motility and intestinal function ^[6]. The potential synergistic effects of its constituent herbs may contribute to the restoration of bowel transit, although the precise mechanisms require further investigation.

From a modern clinical perspective, the pathogenesis of simple intestinal obstruction involves not

only mechanical factors but also bowel wall edema, inflammatory responses, and motility disturbances ^[13]. Interventions targeting a single mechanism may therefore provide incomplete therapeutic effects. Herbal retention enema, through its potential multimodal actions, may offer complementary benefits within conservative treatment strategies ^[6].

Length of hospital stay represents an important clinical and economic outcome ^[14]. Patients in the Xiaochengqi Decoction group exhibited shorter hospitalization durations, suggesting potential advantages in recovery efficiency and healthcare resource utilization. For emergency patients, earlier symptom resolution and reduced hospital stay are of practical clinical relevance ^[14].

Imaging outcomes further supported the clinical findings. The highest rate of improvement in air–fluid levels was observed in the Xiaochengqi Decoction group. Imaging assessments provide relatively objective evidence of treatment response, and the concordance between radiological and clinical outcomes strengthens the interpretation of the results ^[1].

Several limitations should be acknowledged. This was a single-center study with a relatively limited sample size. Long-term outcomes, including recurrence rates, were not evaluated. Additionally, subgroup analyses based on etiology were not performed. Future multicenter studies with extended follow-up are warranted. Overall, Xiaochengqi Decoction retention enema, when combined with conventional conservative therapy, was associated with favorable clinical outcomes in patients with acute simple intestinal obstruction, particularly in promoting bowel function recovery and reducing hospital stay.

5. Conclusion

The findings of this study suggest that Xiaochengqi Decoction enema, when combined with conventional conservative management, may improve clinical outcomes in patients with acute simple intestinal obstruction. This approach was associated with enhanced recovery of bowel function, shorter abdominal pain relief time, and improved imaging findings. Compared with Gastrografin and soap water enema, Xiaochengqi Decoction enema demonstrated favorable trends across multiple clinical parameters, indicating its potential clinical applicability.

Funding

Scientific Research Project of Shanxi Provincial Administration of Traditional Chinese Medicine (Project No.: 2024ZYYC090)

Disclosure statement

The authors declare no conflict of interest.

References

- [1] Ghimire P, Maharjan S, 2023, Adhesive Small Bowel Obstruction: A Review. *Journal of Nepal Medical Association*, 61(260): 390–396.
- [2] Kushram B, Kori A, Thakur D, et al., 2025, Assessment of Intestinal Obstruction: Clinical Presentation, Pathological Findings and Management. *Bioinformation*, 21(4): 892–896.

- [3] Ten Broek R, Krielen P, Di Saverio S, et al., 2018, Bologna Guidelines for Diagnosis and Management of Adhesive Small Bowel Obstruction: 2017 Update of the Evidence-Based Guidelines from the World Society of Emergency Surgery ASBO Working Group. *World Journal of Emergency Surgery*, 13: 24.
- [4] Maienza E, Godiris-Petit G, Noullet S, et al., 2023, Management of Adhesive Small Bowel Obstruction: The Results of a Large Retrospective Study. *International Journal of Colorectal Disease*, 38(1): 224.
- [5] Almeghthawi A, Alrawithi M, Alshehri Z, et al., 2025, Evaluating Hyperosmolar Water-Soluble Contrast Media for Diagnosing Adhesive Small Bowel Obstruction: A Systematic Review and Meta-Analysis of Randomized Controlled Trials. *Cureus*, 17(11): e95937.
- [6] Zhou P, Yang H, Wang J, et al., 2025, Traditional Chinese Medicine for Adhesive Intestinal Obstruction: Theory, Methods and Mechanisms of Action. *Frontiers in Medicine*, 12: 1573655.
- [7] Wang Z, Yue X, Feng S, et al., 2026, Comparative Efficacy and Mechanism of *Moringa Oleifera* Leaves as a Substitute for *Rhei Radix et Rhizoma* in Houpo Sanwu Decoction: A Transcriptomic Analysis of Constipation Alleviation via the PI3K-Akt Pathway. *Journal of Ethnopharmacology*, 355(Pt B): 120517.
- [8] Catena F, Di Saverio S, Kelly M, et al., 2011, Bologna Guidelines for Diagnosis and Management of Adhesive Small Bowel Obstruction: 2010 Evidence-Based Guidelines of the World Society of Emergency Surgery. *World Journal of Emergency Surgery*, 6: 5.
- [9] Gowell M, Baker D, McLachlan G, et al., 2025, Water-Soluble Contrast Agents in Adhesional Small Bowel Obstruction: Meta-Analysis and PRECIS-2 Assessment of Trials. *BJS Open*, 9(3): zraf049.
- [10] Tutino R, Cavaglià M, Pipitone F, et al., 2025, The Diagnostic and Therapeutic Value of Gastrografin in Small Bowel Obstructions. *Frontiers in Surgery*, 12: 1516155.
- [11] Vather R, Trivedi S, Bissett I, 2013, Defining Postoperative Ileus: Results of a Systematic Review and Global Survey. *Journal of Gastrointestinal Surgery*, 17(5): 962–972.
- [12] Deane A, Chapman M, Reintam Blaser A, et al., 2019, Pathophysiology and Treatment of Gastrointestinal Motility Disorders in the Acutely Ill. *Nutrition in Clinical Practice*, 34(1): 23–36.
- [13] Catena F, De Simone B, Coccolini F, et al., 2019, Bowel Obstruction: A Narrative Review for All Physicians. *World Journal of Emergency Surgery*, 14: 20.
- [14] Tennakoon L, Min J, Wu R, et al., 2025, A Nationwide Analysis of Outcomes, Healthcare Encounters and Costs of Small Bowel Obstruction. *Journal of Surgical Research*, 315: 41–47.

Publisher's note

Bio-Byword Scientific Publishing remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.