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Comparison of the postoperative complications for gastric cancer surgery before and during the medical crisis in South Korea: a retrospective observational study

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Purpose: In 2024, South Korea experienced a substantial shortage of medical practitioners, primarily residents and interns, owing to mass resignation from training hospitals. This study aimed to evaluate whether the quality of medical care declined because of this shortage by comparing postoperative complications before and during the period of mass resignation.
Methods: This retrospective observational study assessed patient outcomes among patients with gastric cancer before and during a period of mass resignation at a single tertiary training hospital. Outcomes analyzed included operation duration, length of hospital stays, and complication rates. The effects of the medical crisis on complication rates were analyzed using logistic regression.
Results: A total of 218 and 31 patients underwent surgery during the control and crisis periods, respectively. During the control period, approximately 73 surgeries were performed between February 20 and June 10 each year, which was reduced to 31 during the crisis period. The operation duration (minutes) was 164.5 before the medical crisis and 154.0 during it (P = 0.19). The incidence of postoperative complications before and during the medical crisis was 22.02% (48 of 218) and 9.68% (3 of 31), respectively (P = 0.15). No severe complications (Clavien-Dindo grade ≥IIIa) were observed during the crisis period. Multivariate logistic regression revealed that sex and body mass index were significant variables associated with postoperative complications, but the effects of medical crisis were not.
Conclusion: Despite the medical crisis in South Korea, patient outcomes for gastric cancer surgery were sustained in terms of the frequency of postoperative complications.
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Key Words: Delivery of health care, Gastrectomy, Postoperative complications, Stomach neoplasms

INTRODUCTION

Physician absenteeism from hospitals, though uncommon, can occur primarily due to strikes held to express professional opinions [1-5]. For instance, in the United Kingdom, junior doctors went on strike in 2016 to protest new contract conditions [1]. Similarly, Kenyan physicians went on strike in 2017 over the government's failure to execute an agreement signed in 2013 [2]. South Korea has also experienced several doctors' strikes, with the largest and most recent occurring

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in 2020. This strike was primarily driven by opposition to 4 policies; namely, increasing the number of medical students by 400 each year for the next 10 years, establishing a public medical college for further increase in medical students, including oriental medicine in national health insurance, and approving telemedicine services. The strike, which lasted for 17 days, was led by junior doctors, mainly residents and interns, who left the training hospitals, and by medical students, who refused to attend classes [6].

In 2024, doctors in South Korea, mainly residents and interns, resigned from their training hospitals in disappointment over new medical policies, including the increase of 2,000 medical students. They chose to resign rather than strike due to criticism surrounding doctors' strikes and recent legal changes made shortly before the new medical policy announcement, including a new law revoking medical licenses after an arrest. These changes led to increased legal remedies and discouraged strikes. Their resignations were driven by frustration over medical policies and were based on individual judgment. More than 90% of the essential residents and interns left their positions, impacting the hospital system in South Korea [7], where they constituted approximately 40% of the total doctors in training hospitals [8].

The absence of residents and interns substantially affected hospital operations. Despite being trainees, they played an essential role in hospital management. Studies based on the 2020 strike in South Korea identified alterations in emergency room systems [6,9]; however, research on the impact on operations has been limited. Before the massive resignation in 2024, residents and interns were involved in the operations and inpatient clinic management, suggesting that their massive resignation could have an influence on patient outcomes, including intra- and postoperative complications.

This situation presents a valuable research opportunity, as it is difficult to find hospitals in South Korea operating primarily with specialists. Therefore, this study aimed to focus on patient outcomes by comparing surgical complications before and during the junior doctors' massive resignations.

METHODS

Study design

This retrospective observational study evaluated patient outcomes among patients with gastric cancer at the Asan Medical Center, Seoul, Korea, by comparing the outcomes during the regular period with those during the mass resignation. Asan Medical Center is a tertiary training hospital where approximately 1,600 cases of gastric cancer are operated on annually. The study was approved by the Institutional Review Board of Asan Medical Center, University of Ulsan College of Medicine (No. 2024-0975), which also granted an exemption from obtaining patient consent.

Changes in hospital system after mass resignation

Junior doctors submitted resignation papers and departed the hospital on February 20, 2024, at 6 a.m. All residents and interns in the Department of Gastrointestinal Surgery at Asan Medical Center left the hospital. Other groups of human resources, such as nurses, nursing assistants, and administrative staff, remained as usual.

Before the mass resignation in 2024, operations were conducted by 1 surgical specialist as the surgeon, a fellow or third-year resident as the first assistant, and a first-year resident or specialized nurse as the second assistant. After the mass resignation, specialized nurses filled the first and second assistant roles. Occasionally, the first assistant role was filled by an international fellow from Saudi Arabia or Kuwait. The length of the residency program of General Surgery in Korea is 3 years.

Prior to the mass resignation in 2024, second- and third-year residents and hospitalists acted as attending physicians, managing 25–30 patients each. However, after the resignation this role was filled by hospitalists and faculty members. Night duties, previously performed by residents and fellows, were taken over by faculty members and fellows.

The number of daily gastrectomies, previously approximately 3, was reduced to 1, owing to the lack of resident anesthetists, concerns about patient safety during night duty, and increased clinical workload.

Data collection and study setting

This study captured data of gastrectomy performed between February 20, 2024 and June 10, 2024, and compared it with data from February 20 to June 10 of 2021, 2022, and 2023. By comparing the data from 2021 to 2023 with that in 2024, seasonal variations were accounted for [10-12].

The crisis period was defined as February 20, 2024 to June 10, 2024. The control period was defined as February 20 to June 10 of 2021, 2022, and 2023.

Patients included in this study were operated on by 1 surgical specialist. Data were retrospectively extracted from electronic medical records. To ensure that no data were missed, all patients with gastric cancer were included. Multivariate logistic regression was conducted to estimate the impact of massive resignation on patient outcomes.

Data including age, sex, body mass index (BMI), nutritional status, history of previous surgery, operation method (open gastrectomy and laparoscopic gastrectomy), American Society of Anesthesiologist (ASA) physical status classification, extent of resection, extent of lymph node dissection, multiorgan resection, and patient outcomes, were collected from the Asan Medical Center information database. Patient outcome variables included operation time, length of hospitalization, all

complications based on the Clavien-Dindo classification, and mortality.

Statistical analysis

Categorical variables were presented as number of patients and frequencies (%) and compared using chi-square analyses or Fisher exact test, as appropriate. Continuous variables were presented as median values with interquartile ranges and were compared using the Mann-Whitney U-test, as the variables analyzed in this study, such as age and BMI, were not normally distributed.

Multivariate logistic regression was performed to investigate the effect of massive resignation on patient outcomes. The effect of massive resignation and variables with a univariate logistic regression analysis of P-value <0.05 were considered in the multivariate logistic regression. A P-value of <0.05 was considered statistically significant. The results were presented as odds ratio and 95% confidence intervals.

RESULTS

A total of 218 and 31 patients in the control and crisis periods who underwent gastric cancer surgery, respectively, were included in the study. Approximately 73 surgeries were performed from February 20 to June 10 each year prior to the medical crisis, which decreased to 31 during the medical crisis. No significant difference was observed in terms of patient characteristics between the crisis and control period (Tables 1–3). The operation duration was 164.5 minutes before the medical crisis and 154.0 minutes during it (P = 0.19) (Table 2).

No significant differences were observed between the 2 periods in terms of the first flatus day after surgery (P = 0.99) or the first liquid diet day after surgery (P = 0.28) (Table 3). The length of hospital stay decreased during the medical crisis (control period, 6.12 days; crisis period, 5.52 days), but this change was not statistically significant (P = 0.57) (Table 3).

The incidence of postoperative complications was 22.02% (48 of 218) during the control period and 9.68% (3 of 31) during the crisis period (P = 0.15) (Table 4). No severe complications (Clavien-Dindo grade ≥IIIa) were observed during the crisis period, and the difference against the control was not statistically significant (P = 0.31) (Table 4).

During the crisis period, 3 patients experienced complications, including paralytic ileus, pleural effusion, and both simultaneously. Changes in the type of complications between the control and crisis periods were not significant (P = 0.94) (Table 4).

Based on the univariate logistic regression analysis, age, sex, BMI, hypertension, diabetes mellitus, type of gastrectomy, operation duration, proximal resection margin, and stage based on the AJCC (American Joint Committee on Cancer) staging system were significantly associated with complication rates. Multivariate logistic regression analysis, including the effect of the medical crisis, revealed that sex (P = 0.03) and BMI (P = 0.03) were significant, while the effect of mass resignation (P = 0.29) was not (Table 5).

DISCUSSION

The mass resignation caused by the abrupt announcement of health policies led to significant changes in the hospital system, potentially affecting the quality of general surgery. The absence of junior doctors resulted in a major reduction in manpower, forcing hospitals to reduce the number of surgeries performed.

Table 1. Preoperative characteristics of patients with gastric cancer between the control period and crisis periods

Preoperative variable	Control period	Crisis period	P-value
No. of patients	218	31	
Age (yr)	64.00 (58.00–71.75)	63.00 (52.50–68.50)	0.13[a]
Sex			0.95[b]
Male	128 (58.72)	18 (58.06)	
Female	90 (41.28)	13 (41.94)	
Boby mass index (kg/m^2)	24.30 (22.06–26.76)	22.70 (20.91–26.29)	0.11[a]
Comorbidity			
Hypertension	82 (37.61)	7 (22.58)	0.10[b]
Diabetes mellitus	45 (20.64)	5 (16.13)	0.56[b]
Liver cirrhosis	10 (4.59)	0 (0)	0.62[c]
ASA PS classfication			0.24[c]
I	5 (2.29)	0 (0)	
II	194 (88.99)	31 (100)	
III	19 (8.72)	0 (0)	

Values are presented as number only, median (interquartile range), or number (%).
ASA, American Society of Anesthesiologists; PS, physical status.
[a]Mann-Whitney U-test. [b]Two-tailed chi-squared test. [c]Fisher exact test.

Table 2. Operative characteristics of patients with gastric cancer between the control and crisis periods

Operative variable	Control period	Crisis period	P-value
Type of surgery			>0.99[a]
Open surgery	3 (1.38)	0 (0)	
Laparoscopy	215 (98.62)	31 (100)	
Type of gastrectomy			0.37[a]
Distal gastrectomy	167 (76.61)	26 (83.87)	
Total gastrectomy	42 (19.27)	3 (9.68)	
Completion total gastrectomy	5 (2.29)	2 (6.45)	
No resection	3 (1.38)	0 (0)	
Others	1 (0.46)	0 (0)	
Operation duration (min)	164.5 (146.0–195.8)	154.0 (142.0–178.0)	0.19[b]
Combined excision			0.51[a]
Gallbladder	198 (90.83)	27 (87.10)	
Spleen	20 (9.17)	4 (12.90)	
Extent of lymph node dissection			0.05[a]
No resection	4 (1.83)	0 (0)	
D1+	166 (76.15)	18 (58.06)	
D2	48 (22.02)	13 (41.94)	
Tumor size (cm)	2.50 (1.80–3.88)	2.00 (1.70–3.00)	0.17[b]
Distal resection margin (cm)	6.75 (3.55–10.88)	8.00 (6.00–11.00)	0.25[b]
Proximal resection margin (cm)	3.65 (2.00–5.78)	4.50 (2.60–6.05)	0.19[b]
Reconstruction			0.25[a]
None	3 (1.38)	0 (0)	
Gastrojejunostomy with jejunojejunostomy	1 (0.46)	0 (0)	
Roux-en-Y gastrojejunostomy	167 (76.61)	25 (80.65)	
Roux-en-Y esophagojejunostomy	47 (21.56)	5 (16.13)	
Gastrojejunostomy without jejunojejunostomy	0 (0)	1 (3.23)	

Values are presented as number (%) or median (interquartile range).
[a]Fisher exact test. [b]Mann-Whitney U-test.

Table 3. Postoperative characteristics of patients with gastric cancer between the control and crisis periods

Postoperative variable	Control period	Crisis period	P-value
Stage[a]			0.38[b]
Ia	160 (73.39)	23 (74.19)	
Ib	29 (13.30)	3 (9.68)	
IIa	9 (4.13)	2 (6.45)	
IIb	5 (2.29)	3 (9.68)	
IIIa	4 (1.83)	0 (0)	
IIIb	3 (1.38)	0 (0)	
IIIc	0 (0)	0 (0)	
IV	8 (3.67)	0 (0)	
WHO classification			0.49[b]
Papillary carcinoma	3 (1.40)	0 (0)	
Tubular adenocarcinoma well differentiated	28 (13.02)	2 (6.45)	
Tubular adenocarcinoma moderately differentiated	66 (30.70)	11 (35.48)	
Tubular adenocarcinoma poorly differentiated	66 (30.70)	7 (22.58)	
Signet ring cell carcinoma or poorly cohesive carcinoma	34 (15.81)	10 (32.26)	
Mucinous carcinoma	4 (1.86)	0 (0)	
Gastric carcinoma with lymphoid stroma	8 (3.72)	1 (3.23)	
Others	6 (2.79)	0 (0)	

Table 3. Continued

Postoperative variable	Control period	Crisis period	P-value
T classification			0.83[b]
T1	182 (84.65)	27 (87.10)	
T2	14 (6.51)	1 (3.23)	
T3	8 (3.72)	2 (6.45)	
T4	10 (4.65)	1 (3.23)	
Unknown	1 (0.47)	0 (0)	
N classification			0.93[b]
N0	178 (82.79)	27 (87.10)	
N1	22 (10.23)	2 (6.45)	
N2	8 (3.72)	1 (3.23)	
N3a	6 (2.79)	1 (3.23)	
N3b	0 (0)	0 (0)	
Unknown	1 (0.47)	0 (0)	
M classification			0.60[b]
M0	210 (96.33)	31 (100)	
M1	8 (3.67)	0 (0)	
No. of cancers			0.71[b]
1	205 (95.35)	29 (93.55)	
2	8 (3.72)	2 (6.45)	
3	1 (0.47)	0 (0)	
4	1 (0.47)	0 (0)	
Radicality			0.70[b]
R0	210 (96.33)	30 (96.77)	
R1	4 (1.83)	1 (3.23)	
R2 and no resection	4 (1.83)	0 (0)	
Lymphovascular invasion			0.87[b]
Not identified	150 (70.09)	23 (74.19)	
Present	62 (28.97)	8 (25.81)	
Unknown	2 (0.93)	0 (0)	
Perineural invasion			0.32[b]
Not identified	195 (91.12)	31 (100)	
Present	16 (7.48)	0 (0)	
Unknown	3 (1.40)	0 (0)	
No. of metastatic lymph nodes	0.00 (0.00–0.00)	0.00 (0.00–0.00)	0.63[c]
Length of hospital stay (day)	5.00 (5.00–6.00)	5.00 (5.00–5.00)	0.57[c]
First flatus POD (day)	3.00 (2.00–3.00)	3.00 (2.50–3.00)	0.99[c]
First liquid diet POD (day)	1.00 (1.00–1.00)	1.00 (1.00–1.00)	0.28[c]

Values are presented as number (%) or median (interquartile range).
WHO, World Health Organization; POD, postoperative day
[a]Pathologic staging was updated according to the 8th AJCC (American Joint Committee on Cancer) staging system of gastric cancer. [b]Fisher exact test. [c]Mann-Whitney U-test.

Despite this, our study found no impact on the postoperative outcomes.

Several factors may explain why complications did not differ significantly between the crisis and control periods. First, the number of operations per day decreased from approximately 3 to 1, which might have allowed the operating surgeon to focus more effectively on each procedure. This suggests that optimizing the number of surgeries per day could be beneficial for ensuring adequate patient care and reducing physician workload, thereby minimizing the risk of medical errors. Second, during the months of March, April, and May—when most data were collected—the medical crisis was in its early stages. This period of transition allowed specialists to manage the increased workload, with the faculty and remaining fellows compensating for the absent junior doctors. Thus, hospital operations were sustained, and potential complications were mitigated after the mass resignation, rendering patient outcomes between the periods statistically insignificant.

Despite the lack of statistical significance, the observed decrease in operation duration is notable. During the control period, residents took turns as surgical assistants for different faculty members. Conversely, during the crisis period, a fixed

Table 4. Number of complications between the control and crisis periods

Complication	Control period	Crisis period	P-value
Any complications	48 (22.02)	3 (9.68)	0.15[a]
Clavien-Dindo classification			0.31[a]
Grade <IIIa	44 (20.18)	3 (9.68)	
Grade ≥IIIa	4 (1.83)	0 (0)	
Complications			0.94[a]
None	170 (77.98)	28 (90.32)	
Wound	3 (1.38)	0 (0)	
Stricture	1 (0.46)	0 (0)	
Leakage	4 (1.83)	0 (0)	
Paralytic ileus	8 (3.67)	1 (3.23)	
External bleeding	1 (0.46)	0 (0)	
Internal bleeding	1 (0.46)	0 (0)	
Fluid collection	2 (0.92)	0 (0)	
Medical complications	11 (5.05)	0 (0)	
Others	17 (7.80)	2 (6.45)	

Values are presented as number (%).
[a]Fisher exact test.

specialized assistant supported the faculty member, which potentially improved synchronization and efficiency. Moreover, the absence of residents reduced the time previously allocated to their education, contributing to shorter operation durations.

Although the decrease in hospital stays was statistically insignificant, it remains an interesting observation. Residents play a larger role in postoperative care than in the surgical process itself. This finding may suggest that postoperative care at the hospital was insufficient during the crisis period.

However, some concerns remain. The education of junior doctors, which is crucial for the future healthcare workforce in Korea, has not been addressed, posing challenges in maintaining the country's high-quality healthcare system. Moreover, the reduced number of operations has led to significant financial deficits for most hospitals, with the risk of bankruptcy for tertiary training hospitals. Additionally, the high workload on remaining healthcare providers threatens the system's sustainability and may reduce patient care capacity. Addressing these issues is critical in preventing systemic

Table 5. Univariate and multivariate analyses on complication rates

Variables	Univariate analysis	P-value	Multivariate analysis	P-value
Medical crisis	0.88 (0.76–1.03)	0.11	0.48 (0.10–1.63)	0.29
Age (yr)	1.00 (1.00–1.01)	0.04	1.03 (1.00–1.08)	0.08
Female sex	0.87 (0.79–0.97)	0.01	0.41 (0.18–0.89)	0.03
Body mass index (kg/m^2)	1.02 (1.01–1.04)	0.00	1.13 (1.01–1.25)	0.03
Comorbidity				
Hypertension	1.13 (1.01–1.25)	0.03	1.18 (0.54–2.54)	0.68
Diabetes mellitus	1.18 (1.05–1.34)	0.01	1.87 (0.84–4.09)	0.12
Liver cirrhosis	1.10 (0.85–1.43)	0.45		
ASA PS classification				
I	-	-		
II	0.80 (0.56–1.13)	0.20		
III	1.13 (0.77–1.67)	0.52		
Laparoscopy as type of surgery	0.88 (0.55–1.39)	0.58		
Type of gastrectomy				
Distal gastrectomy	-	-	-	-
Total gastrectomy	1.26 (1.11–1.44)	0.00	1.87 (0.75–4.64)	0.18
Completion total gastrectomy	0.98 (0.72–1.32)	0.88	1.81 (0.08–15.92)	0.63
No resection	0.85 (0.54–1.33)	0.47	-	-
Others	0.85 (0.39–1.85)	0.68	-	-
Operation duration (min)	1.00 (1.00–1.00)	0.02	1.00 (0.99–1.01)	0.47
Combined based excision				
Gallbladder	-	-		
Spleen	0.92 (0.77–1.09)	0.31		
Extent of lymph node dissection				
No resection	-	-		
D1+	1.27 (0.85–1.89)	0.24		
D2	1.12 (0.75–1.68)	0.58		
Tumor size (cm)	1.00 (0.98–1.02)	0.82		
Distal resection margin (cm)	1.01 (1.00–1.02)	0.23		
Proximal resection margin (cm)	0.98 (0.96–1.00)	0.03	0.89 (0.77–1.02)	0.12

Table 5. Continued 1

Variables	Univariate analysis	P-value	Multivariate analysis	P-value
Reconstruction				
None	-	-		
Gastrojejunostomy with jejunojejunostomy	1.00 (0.41–2.46)	>0.99		
Roux-en-Y gastrojejunostomy	1.18 (0.75–1.86)	0.47		
Roux-en-Y esophagojejunostomy	1.44 (0.91–2.29)	0.12		
Gastrojejunostomy without jejunojejunostomy	1.00 (0.41–2.46)	>0.99		
Stage[a]				
Ia	-	-	-	-
Ib	1.13 (0.97–1.31)	0.12	1.41 (0.54–3.54)	0.47
IIa	0.99 (0.78–1.27)	0.94	1.51 (0.21–6.96)	0.63
IIb	0.94 (0.70–1.24)	0.65	0.60 (0.03–4.03)	0.65
IIIa	0.83 (0.55–1.23)	0.35	0.00 (0.00–5.13×10^{43})	0.99
IIIb	1.61 (1.02–2.55)	0.04	7.05 (0.38–216.71)	0.20
IIIc	-	-	-	-
IV	0.94 (0.70–1.24)	0.65	0.53 (0.02–8.02)	0.66
WHO classification				
Papillary carcinoma	-	-		
Tubular adenocarcinoma well differentiated	1.40 (0.86–2.25)	0.17		
Tubular adenocarcinoma moderately differentiated	1.30 (0.81–2.07)	0.28		
Tubular adenocarcinoma poorly differentiated	1.18 (0.74–1.88)	0.49		
Signet ring cell carcinoma or poorly cohesive carcinoma	1.15 (0.71–1.84)	0.57		
Mucinous carcinoma	1.28 (0.70–2.35)	0.42		
Gastric carcinoma with lymphoid stroma	1.00 (0.59–1.69)	>0.99		
Others	1.40 (0.80–2.44)	0.24		
T classification				
T1	-	-		
T2	1.15 (0.93–1.43)	0.19		
T3	1.23 (0.95–1.59)	0.11		
T4	0.99 (0.77–1.27)	0.94		
Unknown	0.83 (0.37–1.83)	0.64		
N classification				
N0	-	-		
N1	1.05 (0.88–1.24)	0.61		
N2	0.91 (0.69–1.20)	0.50		
N3	1.08 (0.80–1.47)	0.61		
N4	-	-		
Unknown	0.81 (0.37–1.82)	0.62		
M classification				
M0	-	-		
M1	0.92 (0.69–1.22)	0.57		
No. of cancers				
1	-	-		
2	0.89 (0.69–1.16)	0.39		
3	0.81 (0.36–1.80)	0.60		
4	0.81 (0.36–1.80)	0.60		
Radicality				
R0	-	-		
R1	0.99 (0.69–1.42)	0.96		
R2 and no resection	0.81 (0.54–1.21)	0.31		
Lymphovascular invasion				
Not identified	-	-		
Present	1.03 (0.92–1.15)	0.65		
Unknown	0.82 (0.46–1.44)	0.49		

Table 5. Continued 2

Variables	Univariate analysis	P-value	Multivariate analysis	P-value
Perineural invasion				
Not identified	-	-		
Present	0.91 (0.74–1.12)	0.38		
Unknown	0.81 (0.51–1.28)	0.36		
No. of metastatic lymph nodes	1.00 (0.98–1.02)	0.74		

Values are presented as odds ratio (95% confidence interval).
ASA, American Society of Anesthesiologists; PS, physical status; WHO, World Health Organization.
[a]Pathologic staging was updated according to the 8th AJCC (American Joint Committee on Cancer) staging system of gastric cancer.

collapse.

This study had several limitations. As a single-center, single-surgeon study, it may not represent the surgical outcomes of other hospitals or surgeons. Complications could vary with different surgical procedures, levels of resident involvement, or professional expertise among surgeons. Future studies focusing on surgeries that extensively require resident and intern involvement, or a nationwide study would be necessary to assess the broader impact of the resignation on the medical system. During the medical crisis period, junior doctors were replaced by highly experienced surgical assistants (with over 10 years of experience); studying hospitals without such assistants would more accurately reveal the impact of the absence of junior doctors.

During the crisis period, there were no patients with an ASA classification III (Table 1). This absence might initially suggest that surgeons were avoiding difficult cases. However, Korean medical law generally does not allow surgeons to refuse patients, making it challenging for them to selectively avoid high-risk cases. Therefore, the absence of patients with an ASA classification III in Table 1 is likely coincidental, as the overall number of patients decreased during the crisis period, reducing the likelihood of encountering patients with an ASA classification III. Another thing to consider is that the medical crisis impacted the entire nation; the hospitals, surgeons, or anesthesiologists might have subconsciously opted to avoid more complex cases.

Despite these limitations, this study pioneers the evaluation of surgical outcomes following the mass resignation of junior doctors in South Korea in 2024.

In conclusion, despite the medical crisis in South Korea, patient outcomes for gastric cancer surgery were stable in terms of the frequency of postoperative complications.

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Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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