

Original Article

# Surgical Outcomes of Primary Colonic Signet Ring Cell Carcinoma: A Single Tertiary Center Retrospective Study and Literature Review

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**Key Words**

Primary signet ring cell carcinoma;  
Colorectal cancer;  
Prognosis;  
Retrospective studies

**Background.** Primary signet ring cell carcinoma of the colon and rectum (PSRCCR) is a rare variant of large intestinal adenocarcinoma, typically diagnosed at advanced stages, which results in poor outcomes.<sup>1,2</sup> This study aimed to investigate the clinicopathologic features and prognostic factors associated with PSRCCR.

**Methods.** Inclusion criteria included histologically confirmed PSRCCR with > 50% signet ring cells and surgical treatment at our institution. Exclusion criteria included synchronous malignancies and incomplete medical records. Patients were categorized based on age, sex, tumor location, and disease stage.

**Results.** Among the ten patients, six (60%) were male, with a mean age of 71.1 years. Tumor sites were evenly distributed between the left and right colons. Only three surgeries were performed laparoscopically. Four operations were emergency procedures that did not undergo preoperative tumor staging, and three of these cases resulted in severe postoperative sepsis requiring ICU admission. The average lymph node positivity rate was 42.7%, with only one patient being free of regional lymph node metastasis. The mean tumor size was 52 mm, and eight patients (80%) presented with stage III disease, while two patients (20%) had stage IV disease. The most common site of metastasis was peritoneal carcinomatosis. Median overall survival was 11.73 months (95% confidence interval, 3.58-18.27 months), while median disease-free survival for curative resection cases was 7.2 months (95% confidence interval, 2.1-12.3 months).

**Conclusion.** Diagnosing signet ring cell carcinoma in the early stages is challenging, and surgical treatment often occurs late, usually after bowel obstruction has developed. The cancer primarily metastasizes to the peritoneum, and prognosis is correlated with the patient's age, the necessity for emergency surgery, the duration of the operation, and the extent of lymph node invasion, as well as the TNM staging identified in postoperative pathology.

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**P**Primary signet ring cell carcinoma of the colon and rectum (PSRCCR) is a rare and highly aggressive subtype of colorectal adenocarcinoma, accounting for less than 1% of all cases. It is characterized by rapid

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progression, high rates of peritoneal dissemination, and poor prognosis. Unlike conventional colorectal cancer (CRC), which benefits from well-established prognostic markers and treatment guidelines, PSRCCR remains poorly understood due to its rarity and the scarcity of robust clinical data.

Patients with PSRCCR often present at an advanced stage due to vague or absent early symptoms, and many require emergency surgery for complications such as bowel obstruction or perforation. These presentations not only contribute to delayed diagnosis but also limit opportunities for curative resection and worsen clinical outcomes. Most published reports are limited to case studies or small retrospective series, making it difficult to define optimal treatment strategies or identify prognostic indicators.

In light of these challenges, further studies are needed to characterize the clinical features, surgical outcomes, and survival determinants of PSRCCR. This retrospective analysis investigates a cohort of PSRCCR patients treated at a tertiary medical center, aiming to identify prognostic factors and recurrence patterns, and contribute to the limited body of knowledge on this rare malignancy.

## Patients and Methods

### Study design and data collection

Patients with PSRCCR who had surgery performed at one tertiary medical center from January 2011 to December 2024 were studied in this research. Clinical information, patient traits, the specific disease details, and the outcomes for each patient were collected from the hospital's forms. The institution's ethical standards were adhered to in the research project, which guaranteed that none of the participants' information was ever revealed.

### Inclusion and exclusion criteria

#### Inclusion criteria

Those eligible for the study were patients aged 18 or over, diagnosed with a tumor containing more

than half signet ring cells, and who had surgical resection done for primary colorectal signet ring cell cancer (primary signet ring cell carcinoma of the colon or rectum) between January 2010 and December 2017.

#### Exclusion criteria

Those with both primary cancers at the same time, distant-spread signet ring cell carcinoma, skimpy pathology details, or short-lasting follow-up records.

#### Surgical definitions

This involved operating so the main tumor was cut away completely along with important lymph nodes and no cancer was found on the resection margins (R0). Surgery that was considered palliative meant doing a procedure to lessen symptoms, such as bowel obstruction, without the aim or likelihood of curing the entire tumor, such as when margins were found to be positive or the disease has spread. Emergency surgery took less than 24 hours after patients arrived with critical complications, whereas elective ones were properly organized based on the pre-surgery schedule. The goal of emergency procedures may vary, as they are chosen based on the patient's clinical condition and disease seriousness.

#### Patient demographics and tumor characteristics

Demographic variables included patient age, sex, body mass index, and presence of comorbid conditions. Clinical parameters encompassed presentation with bowel obstruction, surgery type (emergency versus elective), operative approach (open versus laparoscopic), operative time, estimated blood loss, and post-operative complications. Tumor-specific characteristics included histologic grade, maximum tumor dimension, depth of invasion, lymph node involvement, and TNM staging according to the American Joint Committee on Cancer (AJCC) 8th Edition criteria.<sup>6</sup> Patterns of metastatic involvement, including peritoneal, hepatic, and distant lymph node metastases, were systematically documented.

## Survival analysis

Follow-up assessments were conducted at three-month intervals for the first two years following surgery, six-month intervals for years three through five, and annually thereafter. Overall survival (OS) was defined as the time from the date of surgical resection to death from any cause or last follow-up visit. Disease-free survival (DFS) was defined as the time from curative resection to tumor recurrence or death, whichever occurred first. For patients who underwent palliative procedures, progression-free survival was not calculated due to the presence of residual disease at the time of surgery. Survival distributions were estimated using the Kaplan-Meier method and compared between groups using the log-rank test.<sup>7</sup> Variables analyzed included age (dichotomized at median), sex, tumor location (right versus left colon), tumor stage, type of surgery (curative versus palliative), presence of bowel obstruction, emergency versus elective surgery, and presence of metastatic disease.

## Statistical analysis

Continuous variables were expressed as mean  $\pm$  standard deviation or median with range, as appropriate. Categorical variables were presented as frequencies and percentages. Univariate Cox proportional hazards analysis was performed to identify potential prognostic factors associated with overall survival. Variables with  $p$ -values  $< 0.10$  in univariate analysis were included in the multivariate Cox regression model. Hazard ratios (HR) with 95% confidence intervals (CI) were calculated for all analyzed variables. All statistical analyses were performed using SPSS version 26.0 (IBM Corporation, Armonk, NY, USA). A two-tailed  $p$ -value  $< 0.05$  was considered statistically significant for all analyses.

## Ethical considerations

This retrospective study was exempted from individual informed consent requirements by the institutional review board. All necessary procedures were followed to ensure patient confidentiality during data

collection and analysis.<sup>8</sup>

## Results

### Patient demographics and clinical characteristics

Ten patients with histologically confirmed PSRCCR were identified during the study period, with all tumors containing  $> 50\%$  signet ring cells. No patients had synchronous primary malignancies. The cohort included 6 males (60%) and 4 females (40%), with a mean age of  $71.1 \pm 9.8$  years (range 49-82 years). Tumors were equally distributed between the right colon ( $n = 5, 50\%$ ) and left colon ( $n = 5, 50\%$ ), with no rectal cases identified.

### Disease stage and metastatic patterns

All patients presented with advanced disease, with 8 patients (80%) classified as stage III and 2 patients (20%) as stage IV at the time of diagnosis. **Correction:** Peritoneal metastases were identified in 4 patients (40%), representing the most common site of distant spread. Liver metastases were present in 2 patients (20%), while distant lymph node involvement occurred in 1 patient (10%). The depth of invasion was T3 in 5 patients (50%) and T4 in 5 patients (50%). Mean tumor size was 52 mm. Regional lymph node metastasis was present in all patients (100%).

### Surgical outcomes

Among the 10 patients, 3 (30%) underwent curative resection (R0 resection with clear margins), while 7 patients (70%) received palliative surgical intervention. Bowel obstruction necessitated emergency surgery in 4 patients (40%), with 3 of these patients (75%) developing severe postoperative complications, including sepsis requiring ICU admission. Elective procedures were associated with lower complication rates and improved postoperative outcomes. Seven procedures (70%) were performed via open surgical approach, while 3 cases (30%) were completed laparo-

scopically. The median operative time was longer for curative procedures compared to palliative interventions, reflecting the technical complexity of achieving oncologically adequate resection margins. Adjuvant chemotherapy was administered to 5 patients (50%), while no patients received neoadjuvant therapy due to the acute presentation requiring urgent surgical intervention.

### Survival analysis

The median overall survival for the entire cohort was 11.73 months (95% CI: 3.58-18.27 months). Pa-

tients undergoing curative resection achieved a median survival of 18 months compared to 9 months for

**Table 2.** Multivariate Cox proportional hazards analysis for overall survival

| Variable                                      | HR (95% CI)      | <i>p</i> -value |
|---|------------------|-----------------|
| Age (continuous)                              | 1.08 (0.98-1.19) | 0.112           |
| Emergency surgery                             | 2.45 (0.72-8.34) | 0.151           |
| TNM stage (IV vs. III)                        | 3.12 (0.85-11.5) | 0.087           |
| Lymph node ratio ( $\geq 50\%$ vs. $< 50\%$ ) | 4.23 (0.89-20.1) | 0.069           |
| Operative time (continuous)                   | 1.01 (0.99-1.03) | 0.234           |

No variables reached statistical significance in multivariate analysis, likely due to small sample size.

**Table 1.** Univariate Cox proportional hazards analysis for overall survival

| Variable               | Patients N (%) or mean $\pm$ SD | Median survival (months) | HR (95% CI)       | <i>p</i> -value |
|------------------------|---------------------------------|--------------------------|-------------------|-----------------|
| Age                    | 71.1 $\pm$ 9.8 (49-82)          |                          | 1.10 (1.02-1.18)  | 0.012*          |
| Age $\leq$ 71.1 years  | 5 (50.0)                        | 15.2                     | Reference         |                 |
| Age $>$ 71.1 years     | 5 (50.0)                        | 8.5                      |                   |                 |
| Gender                 |                                 |                          |                   | 0.349           |
| Male                   | 6 (60.0)                        | 11.0                     | Reference         |                 |
| Female                 | 4 (40.0)                        | 12.8                     | 0.65 (0.21-2.01)  |                 |
| Emergency surgery      |                                 |                          |                   | 0.049*          |
| Elective               | 6 (60.0)                        | 15.0                     | Reference         |                 |
| Emergency              | 4 (40.0)                        | 7.0                      | 3.22 (1.01-10.28) |                 |
| Tumor obstruction      |                                 |                          |                   | 0.022*          |
| None                   | 2 (20.0)                        | 18.5                     | Reference         |                 |
| Partial                | 3 (30.0)                        | 12.8                     | 2.1 (0.8-5.5)     |                 |
| Complete               | 5 (50.0)                        | 7.2                      | 4.2 (1.2-14.8)    |                 |
| Operative time         | 183.1 $\pm$ 45.6 (131-270)      |                          | 1.02 (1.00-1.04)  | 0.032*          |
| $\leq$ 183 minutes     | 6 (60.0)                        | 14.2                     | Reference         |                 |
| $>$ 183 minutes        | 4 (40.0)                        | 8.8                      |                   |                 |
| Surgical complications |                                 |                          |                   | 0.003*          |
| None                   | 7 (70.0)                        | 15.2                     | Reference         |                 |
| Septic shock           | 3 (30.0)                        | 5.8                      | 5.4 (1.8-16.2)    |                 |
| TNM stage              |                                 |                          |                   | 0.021*          |
| Stage III              | 8 (80.0)                        | 13.2                     | Reference         |                 |
| Stage IV               | 2 (20.0)                        | 6.5                      | 4.2 (1.2-14.8)    |                 |
| Lymph node ratio       |                                 |                          |                   | 0.011*          |
| $<$ 50%                | 3 (30.0)                        | 18.2                     | Reference         |                 |
| $\geq$ 50%             | 7 (70.0)                        | 9.1                      | 6.54 (1.5-28.4)   |                 |
| Vascular invasion      |                                 |                          |                   | 0.084           |
| Absent (0)             | 7 (70.0)                        | 13.5                     | Reference         |                 |
| Present (1)            | 3 (30.0)                        | 8.2                      | 2.98 (0.87-10.2)  |                 |
| Perineural invasion    |                                 |                          |                   | 0.063           |
| Absent (0)             | 1 (10.0)                        | 18.2                     | Reference         |                 |
| Present (1)            | 9 (90.0)                        | 11.0                     | 3.46 (0.93-12.8)  |                 |
| T classification       |                                 |                          |                   | 0.046*          |
| T3                     | 4 (40.0)                        | 15.8                     | Reference         |                 |
| T4a/T4b                | 6 (60.0)                        | 8.9                      | 3.98 (1.02-15.5)  |                 |

Statistically significant factors ( $p < 0.05$ ).

Note: 1 = Present/Positive, 0 = Absent/Negative for invasion parameters.

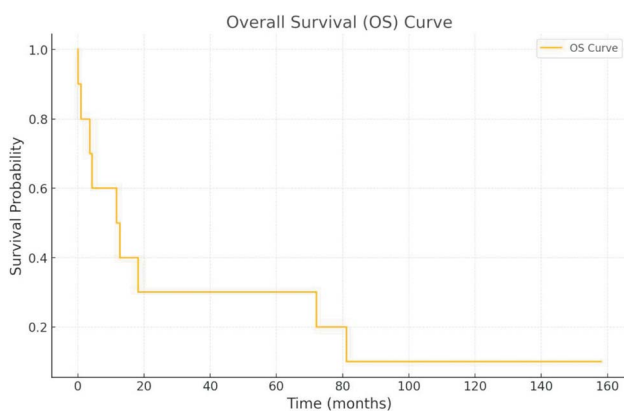
**Table 3.** Clinical features of the 10 patients

| No. | Age/<br>gender | Chief complaints  | Tumor<br>obstruction | Surgical<br>intervention                       | Emergent/<br>elective | Pathologic<br>TNM | Pathologic<br>stage | Metastasis/<br>recurrence |
|-----|----------------|---|----------------------|--|-----------------------|-------------------|---------------------|---------------------------|
| 1   | 64/M           | Abdominal pain for one day  | Complete             | RH   | Emergent              | T3N2bM0           | IIIC                | Distant lymph node        |
| 2   | 79/F           | Stool occult blood showed positive                                      | Nil                  | RH   | Elective              | T3N2bM0           | IIIC                | Nil                       |
| 3   | 82/F           | Nausea and vomiting in two days; lethargy and bedridden for four months | Partial              | RH   | Emergent              | T3N2bM0           | IIIC                | Local recurrence          |
| 4   | 70/M           | Bloody stool and weight loss over 6 kilograms within three months       | Partial              | AR   | Elective              | T4bN2bM1b         | IVB                 | Liver                     |
| 5   | 75/M           | Abdominal pain with constipation for ten days                           | Complete             | Subtotal colectomy with ileo-colic anastomosis | Elective              | T3N2bM0           | IIIC                | Peritoneum; lung          |
| 6   | 82/F           | Nausea and vomiting; constipation for a week                            | Complete             | Extended RH                                    | Elective              | T4aN2bM0          | IIIC                | Peritoneum; lung          |
| 7   | 65/F           | Abdominal pain with constipation for a week                             | Partial              | LH   | Elective              | T4aN2bM0          | IIIC                | Peritoneum                |
| 8   | 71/M           | Bloody stool from stoma (colon tumor obstruction)                       | Complete             | AR   | Emergent              | T4aN2bM1a         | IVA                 | Peritoneum; bone          |
| 9   | 49/M           | Epigastric pain for few days  | Nil                  | RH   | Elective              | T4aN1bM0          | IIIB                | Liver                     |
| 10  | 74/M           | Coffee ground vomitus and abdominal distention                          | Complete             | Extended RH + ileocolonic anastomosis          | Emergent              | T3N1cM0           | IIIC                | Nil                       |

F: female; M: male; R: right colon; L: left colon; RH: right hemicolectomy; LH: left hemicolectomy; AR: anterior resection.

those receiving palliative treatment. The median disease-free survival for patients undergoing curative resection was 7.2 months. Emergency surgery was associated with significantly worse prognosis, with patients undergoing emergency procedures having a median survival of 7 months compared to 15 months for those having elective surgery ( $p = 0.049$ ).

### Survival Outcomes

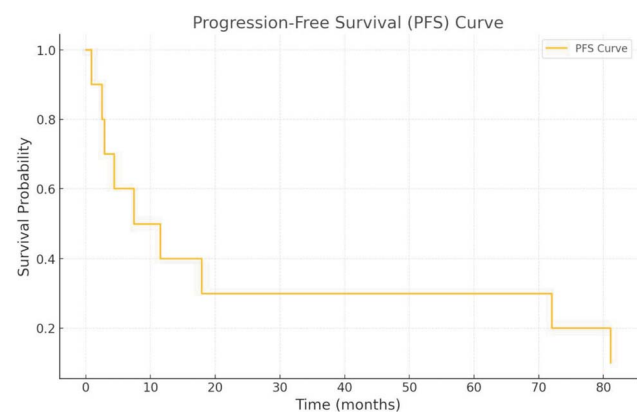


**Fig. 1.** Kaplan-Meier overall survival curve.

## Discussion

### Major findings

This retrospective analysis of 10 patients with PSRCCR treated at a single tertiary center reveals several important findings. The median overall survival of 11.73 months confirms the aggressive nature of this malignancy, with all patients presenting at ad-



**Fig. 2.** Kaplan-Meier progression free survival curve.

vanced stages (III or IV). Emergency surgical intervention, advanced TNM staging, high lymph node involvement, and postoperative complications were significantly associated with worse survival outcomes in univariate analysis, though these factors did not reach statistical significance in multivariate analysis, likely due to the small sample size.

### Clinicopathologic characteristics and literature comparison

Our cohort demonstrated a mean age of 71.1 years, which is notably older than several previous studies analyzing PSRCCR. A comprehensive literature review reveals varying age distributions across published series.

This comparative analysis demonstrates that our cohort had the oldest mean age and uniformly advanced disease presentation. The peritoneal metastasis rate of 40% aligns closely with previous reports (34.8-48.1%), confirming the characteristic pattern of peritoneal dissemination in PSRCCR. However, our median overall survival of 11.7 months was lower than most previous series (14.2-19.1 months), potentially reflecting the advanced age of our patient population and high proportion requiring emergency surgery. The equal distribution of tumors between right and left colon in our series (50% each) differs from several studies reporting left-sided predominance.<sup>10,11</sup> This observation may reflect geographical variations in disease presentation or could be attributed to our limited sample size.

### Surgical management and emergency presentations

The high proportion of emergency surgeries (40%)

in our cohort emphasizes the aggressive infiltrative nature of PSRCCR and its tendency to present with bowel obstruction. This finding aligns with previous reports and highlights the challenge of achieving early diagnosis in this malignancy.<sup>9</sup> The development of postoperative sepsis in 75% of emergency cases underscores the increased morbidity associated with urgent surgical intervention in these patients. Our analysis revealed a significant survival advantage for patients undergoing elective versus emergency surgery (15.0 vs. 7.0 months,  $p = 0.049$ ), consistent with findings from Weng et al.<sup>9</sup> who reported similar patterns. This difference likely reflects both the more advanced disease state requiring emergency intervention and the suboptimal conditions under which emergency procedures are performed. The low utilization of laparoscopic approach (30%) in our series reflects the advanced nature of disease presentation and the technical challenges posed by extensive local involvement and potential peritoneal dissemination.<sup>13</sup> While no significant survival difference was observed between open and laparoscopic approaches, the limited number of laparoscopic cases precludes definitive conclusions.

### Prognostic factors and survival analysis

Univariate analysis identified several significant prognostic factors, including preoperative CEA elevation, emergency surgery, degree of bowel obstruction, postoperative complications, TNM stage, primary tumor site, lymph node ratio, and T classification. These findings largely corroborate previous reports emphasizing the importance of disease stage and presentation circumstances on survival outcomes.<sup>4,5,9</sup> The 90% rate of lymph node involvement in our cohort exceeds

**Table 4.** Comparative analysis of major PSRCCR studies

| Study                       | Year | Sample size | Mean age (years) | Male (%) | Stage III/IV (%) | Peritoneal mets (%) | Median OS (months) |
|-----------------------------|------|-------------|------------------|----------|------------------|---------------------|--------------------|
| Anthony et al. <sup>1</sup> | 1996 | 27          | 58.4             | 59.3     | 92.6             | 48.1                | 14.2               |
| Nitsche et al. <sup>2</sup> | 2013 | 89          | 62.1             | 53.9     | 87.6             | 34.8                | 18.7               |
| Yang et al. <sup>4</sup>    | 2020 | 156         | 59.8             | 61.5     | 79.5             | 41.0                | 16.3               |
| Weng et al. <sup>9</sup>    | 2022 | 31          | 64.2             | 58.1     | 83.9             | 38.7                | 19.1               |
| Belli et al. <sup>10</sup>  | 2014 | 22          | 61.7             | 54.5     | 86.4             | 45.5                | 15.8               |
| Current Study               | 2024 | 10          | 71.1             | 60.0     | 100.0            | 40.0                | 11.7               |

rates reported in some previous series but aligns with the aggressive biological behavior of PSRCCR. The significant impact of lymph node ratio on survival ( $p = 0.011$ ) supports the prognostic importance of nodal burden in this disease, consistent with findings by Schumacher et al.<sup>12</sup> in conventional colorectal carcinoma. Despite identifying multiple significant factors in univariate analysis, multivariate Cox regression failed to demonstrate statistical significance for any variable. This limitation likely reflects the small sample size and relatively short follow-up period, highlighting a common challenge in studying rare malignancies.

### Literature review and knowledge gaps

The existing literature on PSRCCR consists primarily of small retrospective series and case reports, reflecting the rarity of this malignancy. Key studies have consistently demonstrated several characteristics: younger age at diagnosis compared to conventional CRC, predominant left-sided location, high rate of advanced stage at presentation, frequent peritoneal dissemination, and uniformly poor prognosis.<sup>1,2,4,9,10</sup> However, significant knowledge gaps remain regarding optimal treatment strategies. The role of neoadjuvant chemotherapy remains poorly defined, with most patients requiring urgent surgical intervention precluding preoperative treatment. Similarly, the effectiveness of adjuvant chemotherapy in improving survival outcomes requires further investigation, as our small series showed no significant survival benefit, possibly due to sample size limitations.

The pattern of peritoneal dissemination characteristic of PSRCCR suggests potential applicability of cytoreductive surgery with hyperthermic intraperitoneal chemotherapy (HIPEC) in selected cases, though experience with this approach remains extremely limited.<sup>5</sup>

### Study limitations

Several limitations must be acknowledged in this analysis. The small sample size limits statistical power and generalizability of findings. The single-center re-

trospective design introduces potential selection bias and limits external validity. The relatively short follow-up period may not capture long-term survival patterns, and the lack of standardized imaging protocols for follow-up may have affected accurate determination of disease progression timing. Additionally, the absence of molecular characterization of tumors limits our understanding of the biological factors driving the aggressive behavior of PSRCCR. Future studies incorporating microsatellite instability status, mutation analysis, and immunohistochemical profiling may provide insights into potential targeted therapeutic approaches.

### Conclusion

Primary signet ring cell carcinoma of the colon and rectum represents a rare and highly aggressive malignancy with uniformly poor prognosis. This single-center experience confirms the challenging nature of PSRCCR management, with all patients presenting at advanced stages and achieving a median overall survival of only 11.7 months. Key findings from this analysis include the significant impact of emergency surgical presentation on survival outcomes, with patients requiring urgent intervention experiencing markedly worse prognosis compared to those undergoing elective procedures. The high rate of peritoneal dissemination (40%) and extensive lymph node involvement (90%) underscore the aggressive biological behavior of this malignancy. While several clinicopathologic factors demonstrated prognostic significance in univariate analysis, including TNM stage, lymph node burden, and presentation circumstances, the small sample size precluded identification of independent prognostic factors in multivariate analysis. These findings emphasize the critical importance of early diagnosis and prompt, appropriate surgical management when feasible. The consistently poor outcomes across published series highlight the urgent need for improved diagnostic strategies, novel therapeutic approaches, and multicenter collaborative studies to better understand this rare but lethal malignancy. Future research should focus on molecular characterization of PSRCCR,

evaluation of targeted therapeutic options, and assessment of specialized treatment approaches such as cytoreductive surgery with HIPEC in appropriately selected patients. Due to how uncommon PSRCCR is, it will be necessary for different countries to work together and study patients in multiple centers to get enough information for proper treatment advice and better patient results.

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原 著

## 結腸原發性印戒細胞癌的手術治療結果： 單一第三級醫學中心的回顧性研究與文獻回顧

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**背景** 結腸與直腸原發性印戒細胞癌 (Primary Signet Ring Cell Carcinoma of the Colon and Rectum, PSRCCR) 為一種罕見的大腸腺癌亞型，通常在疾病晚期才被診斷，導致整體預後不佳。本研究旨在探討 PSRCCR 的臨床病理特徵及相關預後因子。

**方法** 納入標準為於本院接受手術治療，且病理證實具有超過 50% 印戒細胞成分之 PSRCCR 個案。排除標準為具同步其他惡性腫瘤或病歷資料不全者。患者依年齡、性別、腫瘤部位與疾病期別進行分組分析。

**結果** 共 10 位患者納入研究，其中 6 位 (60%) 為男性，平均年齡為 71.1 歲。腫瘤位置在左右側結腸分布相等。僅 3 例為腹腔鏡手術。4 位患者 (40%) 因腸阻塞接受緊急手術，其中 3 位發生嚴重術後敗血症並需加護病房照護。淋巴結轉移率平均為 42.7%，僅 1 例無區域性淋巴結侵犯。平均腫瘤大小為 52 毫米。8 位患者 (80%) 為第 III 期，2 位 (20%) 為第 IV 期，最常見之轉移部位為腹膜。整體中位存活期為 11.73 個月 (95% 信賴區間：3.58-18.27 個月)，接受根治性手術之患者中位無病存活期為 7.2 個月 (95% 信賴區間：2.1-12.3 個月)。

**結論** PSRCCR 於早期診斷相當困難，病患多於腸阻塞發生後才接受手術治療，導致診斷與治療延遲。腫瘤主要轉移至腹膜。預後與患者年齡、是否接受緊急手術、手術時間長短、淋巴結侵犯程度及術後病理 TNM 分期有顯著關聯。

**關鍵詞** 結腸原發性戒環細胞癌、復發率、存活期、危險因子。