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INTRODUCTION

Anastomotic leak (AL) is a major complication after colorectal surgery associated with morbidity and mortality.

Early diagnosis remains difficult because clinical signs often appear late.

Inflammatory biomarkers such as **C-reactive protein** (CRP) and **procalcitonin** (PCT), may enable earlier detection when combined with routine clinical parameters.

OBJECTIVE

To evaluate the diagnostic performance of postoperative CRP, procalcitonin, ESR, and clinical parameters for early detection of anastomotic leak after colon resection.

METHODS

Study Design

Prospective cohort study (2021–2025).

Study Population

70 consecutive patients undergoing colon resection with primary anastomosis between March 2021 and August 2025 in three private hospitals

Data Collection

Clinical and laboratory parameters recorded on postoperative days (POD) 0, 3, and 5.

Variables and Analysis

CRP, procalcitonin, ESR, heart rate, blood pressure, and temperature were assessed. Anastomotic leak within 30 postoperative days was the primary outcome. Univariate comparison, ROC curve analysis, and penalized logistic regression were performed.

RESULTS

Key Findings

- Anastomotic leak occurred in **4 patients (5.7%)**.
- CRP and PCT demonstrated the strongest predictive performance.
- Highest diagnostic accuracy was observed on **postoperative day 3**.

Biomarker performance				
Marker	POD	Leak	No leak	AUC
CRP	POD3	144 mg/L	89 mg/L	0.80
CRP	POD5	106 mg/L	51 mg/L	0.79
PCT	POD3	2.2 ng/mL	0.9 ng/mL	0.82
PCT	POD5	2.3 ng/mL	0.6 ng/mL	0.84
ESR	POD3-5	Higher	Lower	0.65 - 0.70

Tabla 1. Biomarker performance

Diagnostic performance of CRP, PCT, and ESR for prediction of anastomotic leak after colon resection.

Clinical parameters			
Parameter	Leak	No leak	AUC
HR POD 3	104 bpm	86 bpm	0.73
Temp POD 3	38.1° C	37.2° C	0.72
BP	Lower	Higher	-0.60

Tabla 2. Clinical parameters

Association of postoperative clinical parameters with anastomotic leak and diagnostic accuracy on postoperative day 3.

Clinical cutoffs

- CRP POD3 ≈ 100 mg/L
- PCT POD3 ≈ 1.0–1.2 ng/mL
- HR ≥ 100 bpm
- Temperature ≥ 37.8°C

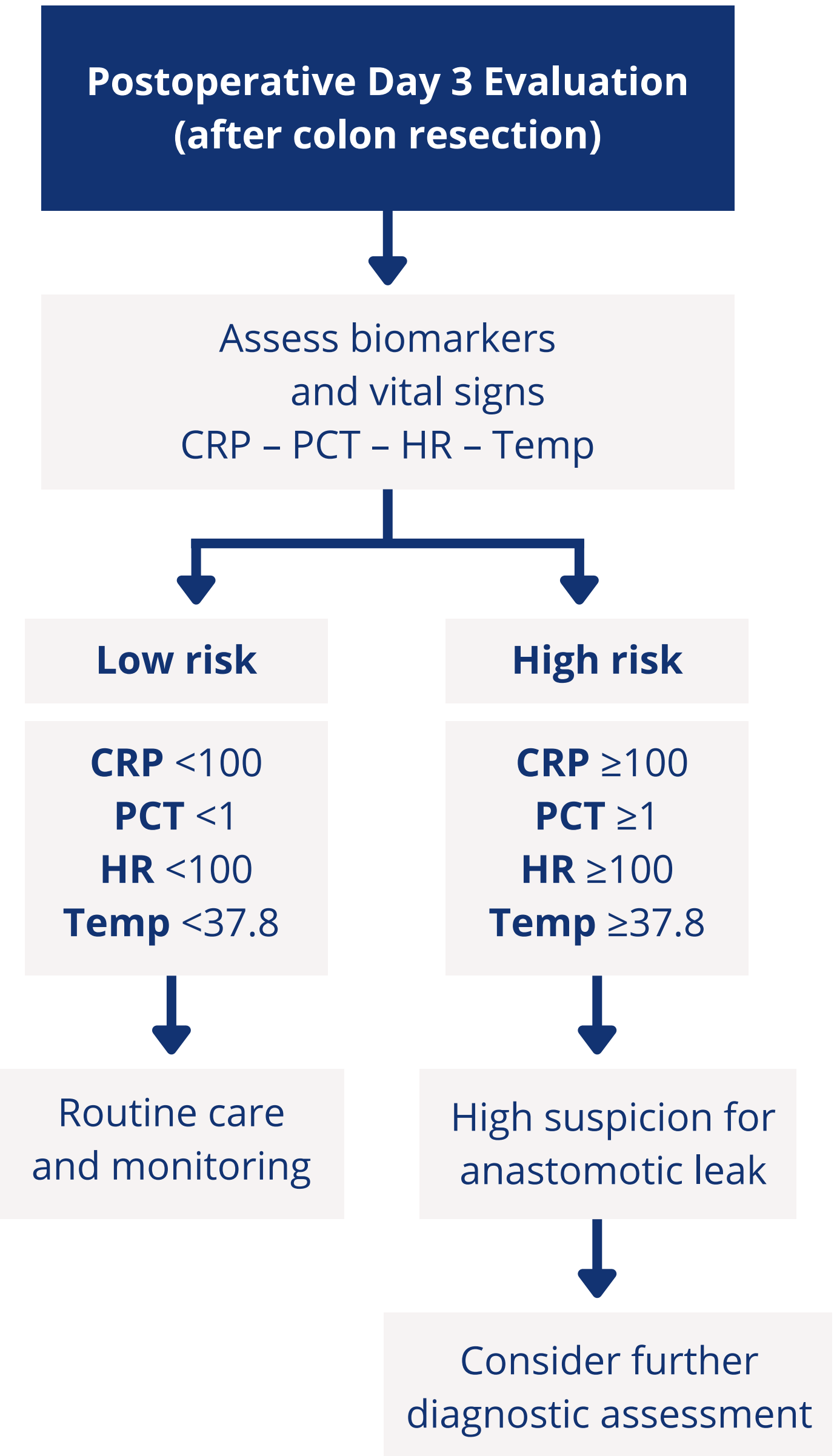


Figure 1. Proposed algorithm for early detection of anastomotic leak on postoperative day 3.

CONCLUSION

CRP and procalcitonin on POD3–5 showed strong predictive value for early detection of anastomotic leak. Heart rate and temperature further improved prediction. Combined biomarker and bedside monitoring may enhance postoperative surveillance after colon resection.

CLINICAL IMPLICATIONS

Routine measurement of inflammatory biomarkers combined with bedside clinical parameters may enable earlier detection of anastomotic leak and support timely imaging and surgical evaluation.

REFERENCES

