COLORECTAL ANASTOMOSIS LEAKAGE AND THE UTILITY OF MODIFIED DULK SCORE IN POSTOPERATIVE MANAGEMENT

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Introduction

- Colorectal anastomotic leak (CAL) is a life-threatening complication with high postoperative morbidity and mortality.
- Modified DULK score (mDULK) was designed to accurately diagnose CAL (Table 1).
- The objectives of this study is to analyze the value of mDULK score, the appropriate cut-off point and the correlation between mDULK score and CAL.

Table 1. ***The mDULK score***[1]

mDULK score critetia	Yes	No
Deterioration	1	0
Respiratory rate ≥ 20	1	0
Abdominal pain, other than wound pain	1	0
C-reactive protein > 250 mg/L	1	0

Material and Methods

Research design

- A prospective cohort study from 01-June-2018 till 31-May-2019.
- All patients who underwent colorectal surgery with primary anastomosis were included.
- Ileoanal or coloanal anastomosis, two or more concomitant anastomosis and operations that had performed due to recurrent cancer were excluded.

Definitions

- CAL was defined as a leak detected on contrast enema computed tomography (CECT), endoscopy or relaparotomy.
- Deterioration was defined as a sudden increase of MEWS score.
- The delay time to diagnosis was recorded from the day when clinical signs suggested leak or mDULK≥3 to the time of diagnosis.

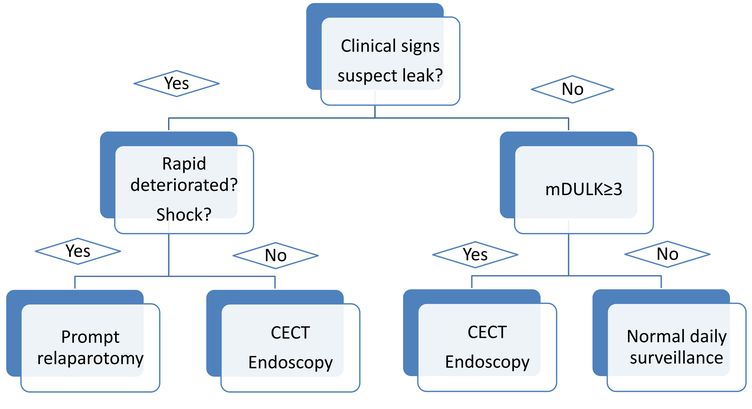
Table 2. ***Risk of CAL (*p-value <0.05)***

		Leak	No leak	P-value *
Age	≥60	24	101	**0.0045**
	<60	10	126	
Anastomotic components	Ileocolic	6	98	
	Colocolic	3	30	**0.004**
	Colorectal	25	99	
Technique	End-to-end	28	138	
	End-to-side	0	1	**0.041**
	Side-to-side	6	88	
Material	Hand-sew	5	60	0.14
	Stapled	29	167	
Postoperative death		1	1	0.244

Surveillance protocol

- Patients was daily examined with MEWS score assessment in the postoperative period. On POD3 and POD5, mDULK was evaluated with appropriate examinations and investigations. If there was any change suggesting CAL, active approach algorithm would be used to diagnose (Figure 1). If leak was doubted without confirmation with radiology or operation, the patient should be re-assessed after 6-12 hours until CAL was confirmed or denied. Until the patient was recovered without any suspicious complication, he was then discharged.

Figure 1. ***Active approach to CAL***[1]



Results

Diagnosis of Colorectal anastomotic leak

- 34 cases with CAL (13.03%) were detected.
- The median time of diagnosis was POD5. The median delayed time was 2 days.
- One case diagnosed on POD 18 had the alert signal since POD3 (mDULK=3).

Leak management

- 12 relaparotomies were performed, 22 cases were treated conservatively.
- Two patients with conservative management after low anastomoses experienced diffuse perineal imflammation.
- Contained leaks detected on CECT are 2.85 times more likely to be treated conservatively than diffused leak (Table 4).

mDULK score

- Both the mean and the highest of mDULK score was significantly related to CAL (p<0,001).
- With the multivariate linear regression, the score significantly helped to predict CAL (p<0,0001).
- With the cut-off value mDULK=3, the sensitivity, specificity, positive value, negative predictive value, likelihood ratio + were respectively 85.3%, 96.9%, 80.6%, 97.8%, 27.7. The Youden index was also maximum at mDULK=3 (Table 2).
- The AUC of ROC curve was 0.96.

Table 3. ***The value of mDULK score***

mDULK score	≥1	≥2	≥3
Pse	100	97,06	**85,29**
Psp	38,77	72,25	**96,92**
PPV	19,65	34,38	**80,56**
NPV	100	99,39	**97,78**
LR+	1,633	3,497	**27,6596**

Conclusion

- mDULK score was proven to be a good and reliable method in detecting postoperative CAL. At the cut-off point of 3, this score shown the best value of a test of diagnosing. So that, we recommend using this cut-off point to be a marker at which surgeons have to active seek for CAL .
- We recommend using postoperative active approach algorithm to diagnose CAL in daily practice to reduce the delayed time, morbidity and mortality of this complication.
- Due to the limited circumstance in our country, CRP level could not be performed daily so that mDULK was not abled to be assess as the primary study. More study with routine assessment should be done in the future to give more evidence of this diagnosing method.

Table 4. ***Comparing the difference between treatment strategies (*p-value <0.05)***

		Conservative	Surgical	P-value*
Anastomotic components (case)	Ileocolic	3	3	**0.832**
	Colocolic	2	1	
	Colorectal	17	8	
Contrast leak on CECT (case)	Contained	20	1	0.035
	Diffuse	6	3	
Median postoperative length of stay (day)		14	15.5	0.1068

References

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