

Colonic anastomotic leak diagnosis

- By,
 - ***Waleed Omar***
- Prof. of general and colorectal surgery Mansoura university

leak

- Def. According to international study group of rectal cancer (Isgrc):

Communication between the intraluminal and extraluminal compartment owing to a defect of the integrity of the intestinal wall of the anastomosis.

Detailed criteria:

- Apparent discharge of gas, pus, faeces from abdomen or pelvic drainage tube.
- Anastomosis defect confirmed by endoscopy or CT contrast study.
- Confirmed during laparotomy.

Early leak: During first 30 days:

- usually become apparent between 5th and 8th postoperative day (POD) with exceptions
- The timing of diagnosis is variable from patient to patient, tends to be early in 1st-2nd day POD in mechanical and structural causes and later 5th-7th POD in ischemic causes.

Delayed leak:

- May present months later as non emergent cutaneous fistula or intraperitoneal collection especially in patient receiving chemotherapy.

Grading :

- G1 (no clinical) :diagnosed by radiology or endoscope.
- G2 (minor clinical) :local inflammatory lesion.
- G3 (major clinical) :sever disruption and sepsis.
- G4 (necrosis) : diagnosed by endoscope.

Suspicion



- Any patient is not progressing as expected or deteriorated after anastomosis should be considered to have anastomotic leakage until proved otherwise.

diagnosis

A decorative horizontal bar consisting of a solid teal line on top, followed by a white line, and then three thin teal lines below it.

- Timely diagnosis of anastomotic leakage is therefore of utmost importance, yet there is no consensus as to the 'best' diagnostic test. Practice varies between institutions and, because of the acute nature of the condition, there is a paucity of data comparing the sensitivity and specificity of the various modalities.
- The diagnosis of AL may be clearly done without the need of any diagnostic modalities by only sharp clinical signs, however, the majority of patients present with confusing symptoms.

Clinically:

- Pain,
- fever,
- tachycardia,
- peritonitis,
- faeculent or purulent discharge.

Radiologically:

- Currently, CT with contrast enema and water-soluble contrast enema (WSCE) are the most frequently applied studies in the detection of AL.

Intraoperative:

- Anastomotic disruption.
- Gross enteric spillage.

prediction

in high risk patient.

Risk factors :

<i>Patient factors :</i>	<i>Surgical factors :</i>
DM	Site of anastomosis
Smoking	Peritoneal contamination
Alcohol	Emergency Surgery
Male Gender	Long intraoperative time
Old age	
Obesity	
Neoadjuvant therapy	

□ *PATIENT WITH RISK FACTORS NEEDS MORE PROACTIVE APPROACH FOR EARLY DIAGNOSIS.*

□ *PREDICTION MAY BE ACHIEVED USING **Biomarkers.***

Biomarker

Prediction of AL using Biochemical studies.

Biochemical Criteria “Biomarker”

- ❑ Biochemical and cellular testing in which molecules “biomarker” could be measured at the anastomotic site for monitoring of AL.
- ❑ This may help to identify leakage prior to the onset of clinical signs or earlier than the leucocytosis.
- ❑ It tends to have a lower sensitivity and positive predictive values (PPV) attributed to non-specific nature as they are acute phase reactants.

❑ Cini et al 2013 in their systematic review and meta-analysis of the *peritoneal fluid cytokines*

they testified that :

- ❖ The level of *TNF- α* for those with AL was significantly higher than for those without AL onwards starting from the 2nd POD with the peak value on the 5th POD.
- ❖ Also, the *IL-6* level for patients with AL in comparison to those without AL showed significant results with the peak value on the 4th POD.
- ❖ The levels of *IL-1 and IL-10* were significantly higher in the 3rd POD respectively for those with AL in comparison to those without.

❑ Singh et al 2014 in a systematic review and meta-analysis they testified that :

- ❖ *C-reactive protein* on the 3rd-5th POD has a good negative predictive value (NPV), but not a good PPV in prediction of AL after colorectal surgery.
- ❖ Also, they reported that laparoscopic surgery compared to open surgery had lower levels of CRP and pro-inflammatory cytokines

Messias et al., 2020 reported that there were no statistically significant differences in *serum CRP levels* in the first 3 PODs .however,

- ❖ After POD 4 there was a significant increase in serum CRP levels in patients with anastomotic leakage (median, 246.4 mg/L) compared with those without leakage (median, 113.5 mg/L; $P = 0.002$).
- ❖ Serum CRP levels increased from POD 2 in patients with leakage and decreased in those without leakage .
- ❖ Peak levels were seen on POD 5 in patients with leakage and on POD 2 in those without leakage.

Giaccaglia et al., 2014 reported that procalcitonin is an earlier, more sensitive, and reliable marker of AL Compared with more established biochemical values such as CRP and WBC.

- ❖ Increased PCT levels in early PODs after colorectal surgery may provide a more effective way to detect AL, before clinical symptoms appear.
- ❖ Moreover, normal PCT values might be also a useful marker to facilitate a safe and early discharge of selected patients after colorectal surgery.

Scoring System

Dutch leakage score

A decorative graphic consisting of several horizontal lines of varying lengths and colors (teal, light blue, white) extending from the right side of the slide.

Dutch Leakage Score

den Dulk et al., proposed Dutch Leakage Score (DLS) or the DULK score which was a clinical scoring system aimed to reduce the diagnostic delay by calculating the daily leakage score based on the sum of :

- ❑ ***clinical symptoms*** (fever, heart rate, respiratory rate, urine production, mental status, clinical condition)
- ❑ ***local signs*** (ileus, gastric retention, fascial dehiscence, abdominal pain)
- ❑ ***laboratory findings*** (CRP, Leucocytes, urea, creatinine)
- ❑ ***nutritional status*** (tube feeding, TPN).

Item	Normal value	Score (points)	Abnormal value	Score (points)
General				
Fever	≤ 38.0°C	0	> 38.0°C	1
Heart rate	≤ 100/min	0	> 100/min	1
Respiratory rate	≤ 30/min	0	> 30/min	1
Urinary production	≥ 30 ml/h or 700 ml/day	0	< 30 ml/h or 700 ml/day	1
Mental status	Normal mental status	0	Agitation or lethargic	2
Clinical condition	Stable or improving condition	0	Deterioration	2
Local physical examination				
Signs of ileus	No ileus	0	Ileus	2
Gastric retention	No gastric retention	0	Gastric retention	2
Fascial dehiscence	No fascial dehiscence	0	Fascial dehiscence	2
Abdominal pain, other than wound pain	No pain other than wound pain	0	Pain other than wound pain	2
Laboratory investigation				
Signs of infection	No increase in leukocyte number or CRP	0	Increase of ≥ 5% in leukocyte number or CRP	1
Kidney function	No increase in urea and creatinine	0	Increase of ≥ 5% in urea or creatinine	1
Diet				
Nutritional status	Normal diet	0	Tube feeding/TPN	1/2

The leakage-score is the sum of all points. If a patient receives both tube feeding and total parental nutrition (TPN), only tube feeding is scored (1 point). CRP = C-reactive protein.

❑ These parameters were collected from a retrospective cohort combined with a literature review, then they tested its feasibility prospectively with items scored abnormally given 1 or 2 points.

❑ A decision algorithm was based on the leakage-score :

✓ *score ≤ 3 no action,*

✓ *4-7 re-evaluation in 12 hours,*

✓ *≥ 8 CT rectal contrast.*

❑ A further modification of the DULK score has published by Dulk et al with inclusion only of four items

(*respiratory rate, clinical condition, abdominal pain, CRP level*) with similar results to the original score.

Thank you

A decorative graphic consisting of a solid teal horizontal bar that spans the width of the slide. Below this bar, on the right side, there are three thin, parallel white horizontal lines that extend further to the right, creating a stepped or layered effect.