

## CASE REPORT

## Technical Note: Minimally Invasive ‘Second Look’ in the Era of Laparoscopic Surgery

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### Abstract

Benefits associated with minimally invasive surgery, in both elective and emergency practice, are well established. In recent years, laparoscopic surgery has been embraced, and has gained increasing popularity. We describe a modification of a previously described technique in the context of the ‘second look’ in the era of laparoscopic surgery.

A seventy year old patient with type one respiratory failure presented with an acute abdomen. Pre-operative imaging suggested mesenteric ischaemia. A decision was made to proceed with laparoscopic surgical intervention. An infarcted small bowel segment was identified and resected. A primary anastomosis was constructed, but in view of the underlying pathological process, it was felt that a ‘second look’ was required. This was facilitated by leaving an 11mm port in left lower quadrant after the primary procedure, so that twenty four hours post-operatively the anastomosis could be inspected.

The concept of the ‘second look’ is well established in the context of mesenteric ischaemia. A laparoscopic ‘second look’ following open surgery has been previously described. We have embraced the ‘second look’ concept and we were able to perform both procedures in a minimally invasive fashion.

**Keywords:** Mesenteric ischaemia; laparoscopy; second look

### Introduction

The benefits associated with minimally invasive surgery, in both elective and emergency practice, are well established. In recent years laparoscopic surgery has been embraced and gained increasing popularity. We describe a modification of a previously described technique in the context of the ‘second look’ in the era of laparoscopic surgery.

### Case Report

A seventy year old patient with a history of type one

respiratory failure relating to chronic obstructive airway disease, secondary to smoking, presented with clinical

would potentially minimise post-operative respiratory complications.



Figure 1: Port left in-situ in the left lower quadrant with an intercostal drain in situ to protect the viscera from port related trauma

evidence of systemic sepsis (manifested by pyrexia, sinus tachycardia, and elevated inflammatory indices) in conjunction with generalised peritonitis on abdominal examination. Urgent imaging by contrast enhanced CT scan of the abdomen and pelvis demonstrated thickened small bowel loops consistent with ischaemia with associated free intra-peritoneal fluid. An incidental lesion was identified in the lower lobe of the right lung that was radiologically thought to represent a bronchial carcinoma. A decision was made to proceed with urgent surgical intervention, with a pre-operative plan to transfer the patient to the intensive care unit post-operatively for respiratory support. A minimally invasive approach was chosen as the expertise and equipment were available, and it was felt that if the procedure could be completed laparoscopically, we

The Hassan technique (infra-umbilical) was used to establish a pneumoperitoneum. Laparoscopy confirmed the radiological diagnosis of an ischaemic small bowel loop, with free blood in the intra-peritoneal cavity. Further ports were placed in the suprapubic region (5mm), with a further port sited in the left lower quadrant (11 mm). The small bowel loop was mobilised and delivered through an incision that was extended through the umbilicus (4 cm), which allowed resection and construction of a stapled side to side anastomosis. Following this the mini-laparotomy wound closed. It was felt that a 'second look' was required to ensure that the anastomosis was healthy twenty four hours after the procedure. To facilitate this and minimise trauma, the 11mm port was left in-situ in the left lower quadrant. A 28F intercostal chest drain was placed through

the port to reduce the risk of port-related visceral injury. This was then sutured to the anterior abdominal wall and then wrapped in a Betadine soaked swab and dressed with Tegaderm (Figure 1).

The following day, the patient was taken back to theatre and a second look laparoscopy was performed. The anastomosis that had been constructed was seen to be healthy. The patient was extubated following this second procedure and soon made a rapid recovery, transferred back to the ward on post-operative day one, and ready for discharge on post-operative day five.

Prior to discharge, the patient underwent a biopsy of the lesion on her right chest, which was histologically proven to be a primary bronchial carcinoma. Histology of the resected specimen demonstrated changes consistent with venous infarction, and it was presumed that this was a complication secondary to a pro-thrombotic state related to the patient's underlying malignancy.

## Discussion

In recent years, the use of laparoscopy in the context of an acute abdomen has gained increasing popularity. It provides diagnostic accuracy and also allows a therapeutic option (1,2). Surgery is associated with activation of a variety of physiological and immunological alterations that can contribute to immunosuppression and lead to significant post-operative morbidity and mortality. There is evidence to support the theory that laparoscopic surgery induces less surgical stress, and as such results in a proportionally decreased immunological change, with lymphocyte proliferation and gut oxygen tension better preserved (3,4). However, it is equally important to consider the cardio-respiratory effects of pneumoperitoneum. Previous studies have highlighted changes in chest wall and lung impedance during insufflation, which may be exacerbated by patient positioning. However, in the majority of patients, this does not seem to be critical. In situations where respiratory function is compromised, reduction of intra-abdominal insufflation pressure and repositioning of the patient may allow these difficulties to be overcome (5). The cardiovascular changes include a reduction in cardiac index as well as an increase in the systemic vascular resistance, although again in the majority of cases this can be overcome (6).

The concept of the 'second look' procedure in the management of mesenteric ischaemia has been well described, including ischaemia resulting from acute venous thrombosis (7,8). The rationale for the 'second look' is that it gives an opportunity for re-inspection of an anastomosis and the residual bowel to ensure that there are no further

ischaemic changes. Our approach is a modification technique that has been previously described by Spittler et al; (9). Specifically, rather than performing a laparotomy as the primary procedure, we have converted this to a complete minimally invasive, staged procedure, resulting in all of the benefits of laparoscopic surgery.

The equipment used for this procedure would be available in most centres where laparoscopic surgery is performed, and the technique is reliable and easily reproducible. The technique employed is safe, with the ports placed under direct vision, and an intercostal drain used to protect the viscera from the port that is left in-situ to allow re-creation of the pneumoperitoneum and subsequent later inspection of the anastomosis. The procedure can be completed rapidly in conjunction with the principles defined in the context of damage control surgery.

## Conclusion

The concept of the 'second look' is well established in the context of mesenteric ischaemia. A laparoscopic approach of this intervention has previously been described. We have embraced this concept and were able to perform both procedures using a minimally invasive approach, which was beneficial to our patient's recovery. We advocate this technique which we believe is simple, and reproducible. We will continue to adopt this approach in our future practice.

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