Can surgeon operated ultrasound increase the safety of laparoscopic surgery?

Laparoscopic (aka minimally invasive or keyhole) surgery is a modern surgical technique that allows surgeons to perform complex abdominal surgery through much small incisions than conventional “open” surgery. When compared to open surgery, laparoscopic surgery offers patients less postoperative pain, a lower risk of bleeding, and shorter recovery times, translating to less time spent in hospital and less time required off of work. Laparoscopic surgery is performed by placing thin ports through small incisions on the abdominal wall. The surgeon is able to see inside the abdomen by placing a camera through one of the ports and operate using long, thin instruments placed through the remaining ports. While generally safe, placement of the first port results in an injury to the bowel in approximately seven in 10,000 operations. If this occurs, there is a 2.5 to 5% risk of death. This risk of bowel injury during first port placement is increased if the patient has scar tissue (aka abdominal adhesions) in the abdomen fixing the bowel to the abdominal wall. The most common cause of adhesions is previous abdominal surgery. Surgeons typically avoid areas of previous surgical incisions, however this does not guarantee safe placement of surgical ports. Unfortunately patients who have extensive surgical incisions are often deemed not appropriate for laparoscopic surgery due to the uncertainty of safe entry.

Previous studies have shown ultrasound has been shown to be able to identify areas that are free of adhesions and safe for laparoscopic port placement, however these studies studied ultrasound in the hands of expert radiologists who are not typically available at the time of surgery. For ultrasound to be widely adopted, surgeons who place laparoscopic ports would have to be able to perform the ultrasound assessment themselves. We aimed to see if surgeons previously unfamiliar with using ultrasound would be able to use it to identify areas with adhesions on their surgical patients.

Nine surgeons underwent a brief training session where they learned to use ultrasound to identify areas in the abdomen free from adhesions. After the training session, they used ultrasound to assess for adhesions in patients about to undergo surgery. 145 patients with a history of previous abdominal surgery were assessed. Compared with using previous surgical scars as a marker for adhesions, surgeon performed ultrasound more reliably identified safe areas for laparoscopic port placement (areas free of adhesions). In this study, when surgeons identified a safe area for port placement using ultrasound, they were correct 99.5% of the time. When they used skin scars, they were correct only 88.9% of the time.

This study suggests that surgeons can use ultrasound to improve the safety of laparoscopic surgery.

Minaker S, MacPherson C, and Hayashi A
Department of Surgery, Island Health, Victoria, BC, Canada

Department of Surgery, University of British Columbia, Vancouver, BC, Canada

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Can general surgeons evaluate visceral slide with transabdominal ultrasound to predict safe sites for primary laparoscopic port placement? A prospective study of sonographically naïve operators at a tertiary center.
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