

Can We Really Tell Who Needs an Operation for SBO?

Small Bowel Obstruction--Who Needs an Operation? A Multivariate Prediction Model.

Zielinski MD, Eiken PW, et al:

World J Surg 2010; 34 (May): 910-919

No single finding can predict the need for operation in a patient with small bowel obstruction.

Background: The operative dictum of "the sun should not rise nor set on a patient with a small bowel obstruction" (SBO) is now history. However, trying to determine which patients should have operative intervention remains a discussion item.

Objective: To determine which clinical and imaging factors are associated with need for surgical exploration of a patient with an SBO.

Design: Retrospective review.

Participants: 100 consecutive patients with an SBO who had CT scanning as part of their evaluation.

Methods: Charts were reviewed for clinical symptoms, underlying cause, laboratory data, and imaging interpretation. Two groups of patients were compared: 1 required operative management (group 1) and the other resolved without surgery (group 2). The primary outcome was to determine any factors that correlated with operative treatment. CT scans were assessed for small bowel (SB) dilatation, fecalization of the SB, thickened SB wall, transition point, pneumatosis, and free fluid. A univariate and multivariate analysis was performed.

Results: Group 1 comprised 48 patients, and group 2 comprised 52 patients. A malignant obstruction was more common in group 1, and adhesive obstruction was more common in group 2. Morbidity was higher in group 1, but mortality was not different between groups. On multivariate analysis, factors associated with operative management included vomiting, mesenteric edema, free intraperitoneal fluid, and lack of SB fecalization. The odds ratio favoring operation was almost 5 for vomiting and 4 for mesenteric edema and free fluid. Fecalization of the SB actually was associated with a decreased risk of operative intervention. If all 4 factors were present, 90% of patients required operative therapy.

Conclusions: 4 clinical signs can be used to select patients with SBO who require operative intervention.

Reviewer's Comments: This article is 1 of 3 that we have reviewed in the last 3 months about SBO. The first said CT scanning could not predict operative management. The second revisited the idea of water-soluble contrast being helpful in determining operative candidates. Now, we have some clinical and imaging findings that are touted as being 90% accurate in selecting operative candidates. Not bad. The findings should not really surprise any of us since the imaging findings are associated with bowel ischemia, although one would think that SB fecalization would be a late finding too. Vomiting as a clinical sign is poorly defined in the methods section, and one must assume that this is protracted or ongoing vomiting. That would be my assumption at least. Thus, we are still left with some "interpretation" by the bedside clinician as to how to apply these 4 signs. I submit nothing has really changed with this report except maybe to help support early CT use in an SBO patient. Whether that is good or bad will require more study and better comparative effectiveness research. (Reviewer-John A. Weigelt, MD).

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Keywords: Small Bowel Obstruction, Surgery

Print Tag: Refer to original journal article

DVT Prophylaxis Can Be Used Safely in Head-Injured Patients

Pharmacologic Thromboprophylaxis Is a Risk Factor for Hemorrhage Progression in a Subset of Patients With Traumatic Brain Injury.

Levy AS, Salottolo K, et al:

J Trauma 2010; 68 (April): 886-894

Deep vein thrombosis prophylaxis in the head-injured patient appears to be safe if the patient and CT scan are improving.

Background: Venous thromboembolism (VTE) is a potential complication for the head-injured patient. Current recommendations suggest these patients receive pharmacologic and mechanical prophylaxis.

Objective: To determine if heparin is safe in brain-injured patients.

Design: Retrospective review.

Participants: 340 patients with a brain injury by CT scan.

Methods: Patients were stratified into 2 groups based on follow-up CT scan. These 2 groups were divided into groups based on receiving heparin or not. Demographic information was collected, as well as type of brain injury, occurrence of VTE, and timing of heparin prophylaxis. Timing was defined as early if given within 72 hours and late when given at or after 72 hours. The primary outcome was progression of brain injury related to heparin administration.

Interventions: Addition of heparin for deep vein thrombosis (DVT) prophylaxis.

Results: Among all patients, 110 (32%) had a progression of their brain injury by CT scanning. Median time for progression was 1 day (range, 0 to 17 days). Thirteen patients who had progression received heparin and 79 did not. Further progression occurred in 67% of 13 patients receiving heparin and in 27% of those not receiving heparin. The greatest predictor of subsequent brain injury progression in these patients was exposure to heparin showing, an odds ratio increase of 13-fold. Other significant predictors included a Glasgow Coma Scale score of 3 to 8, body mass index >25, and extra or subdural hematoma. It was estimated that heparin accounted for 16% of the risk of subsequent brain injury progression. Of patients, 248 had no progression on follow-up CT scan; 156 received heparin and 92 did not. Further brain injury progression occurred in 5% of patients receiving heparin and 11% not receiving heparin. This progression was not related to heparin administration or its timing.

Conclusions: Heparin use in brain-injured patients is associated with an increased risk of further hemorrhage progression when the follow-up CT scan shows CT brain injury progression.

Reviewer's Comments: These results demonstrate what most of us practice. The patient with brain injury progression on their follow-up CT scan is not a candidate for heparin prophylaxis. Alternatively, the brain-injured patient with no progression on follow-up CT scan can be given DVT prophylaxis with heparin. The risk associated with heparin use in the brain-injured patient population was calculated as 16%. The authors suggest that mechanical prophylaxis is adequate in these high-risk patients, although data supporting that statement are unclear. We begin heparin after the follow-up CT scan is available. If the scan is unchanged at 24 hours, then heparin prophylaxis is started. If the scan is changing or the patient is changing, then heparin is withheld and only mechanical prophylaxis is started. Heparin would be started only after the scan and patient are improving. (Reviewer-John A. Weigelt, MD).

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Keywords: Head Trauma, Deep Vein Thrombosis Prophylaxis

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Endovascular Procedure Benefit -- What Is It?

Open Versus Endovascular Intervention for Critical Limb Ischemia: A Population-Based Study.

Cull DL, Langan EM, et al:

J Am Coll Surg 2010; 210 (May): 555-563

Increased use of endovascular procedures for critical limb ischemia has not lowered amputation rates.

Background: Patients with critical limb ischemia are at great risk for amputation. Lower extremity amputation for vascular disease is associated with high morbidity and mortality. Use of endovascular procedures is common in these patients.

Objective: To determine if more endovascular procedures, instead of open, are being done in patients with critical limb ischemia and to determine outcomes of these procedures.

Design: Retrospective review of prospectively collected data in a statewide database managed by South Carolina.

Participants: 571 patients had a revascularization procedure during 1996 (pre-endovascular period), and 758 revascularization procedures were done in 2005 (post-endovascular period).

Methods: ICD-9 codes were used to define open and endovascular procedures. The database allowed patients to be identified for secondary procedures but not for limb outcomes. A secondary procedure was defined as occurring within the first year. Demographic information was collected including comorbidities. The primary outcome was the number of secondary procedures and whether amputation rates had fallen.

Interventions: 1- and 3-year amputation rates were estimated for each base year.

Results: In 1996, 26% of index revascularizations were endovascular procedures and, in 2005, this number had increased to 51%. The number of secondary procedures after open procedures in 1996 was 7% compared to 13% for endovascular procedures. These numbers for 2005 were 14% and 24%, respectively. The 1-year risk for amputation was 30% to 40% regardless of year or procedure. Endovascular procedures had shorter lengths of stay by approximately 3 days, but the average was still 7 to 10 days for all groups in 2005.

Conclusions: Endovascular procedures in patients with critical limb ischemia are increasing in South Carolina. No reduction in amputation rates has subsequently occurred.

Reviewer's Comments: This is a very nice population study of patients with critical limb ischemia. The authors document an increase in endovascular procedures from 1996 to 2005. This change is certainly evident in our institution. The open case is done <50% of the time. This change was associated with an increased rate of secondary vascular procedures within 1 year, with no evidence of a decrease in amputation rate. While not the primary outcome, the other interesting finding was a shorter length of hospital stay of approximately 3 days. The authors suggest that these patients have multiple comorbidities, which accounts for their hospital stay, and the endovascular procedure does not have much of an effect on hospitalization. These data will be challenged given the nature of the database. Regardless, it offers a view of our treatment approach for patients with critical limb ischemia as we transition to more endovascular procedures. Endovascular techniques are not going to go away. How best to use them in a cost-effective manner is the next step in their application. (Reviewer-John A. Weigelt, MD).

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Keywords: Critical Limb Ischemia, Open vs Endovascular Intervention

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Midline Closure Techniques -- An Answer Finally!

Elective Midline Laparotomy Closure: The INLINE Systematic Review and Meta-Analysis.

Diener MK, Voss S, et al:

Ann Surg 2010; 251 (May): 843-856

Nonabsorbable suture used to close elective midline laparotomy wounds is associated with a high rate of incisional hernia formation.

Background: One goal of abdominal wound closure is to avoid postoperative hernia formation. Incisional hernia rates range from 10% to 20%. The dispute over the best technique for wound closure continues.

Objective: To evaluate currently available studies on midline wound closure and to attempt to make a recommendation.

Design: Meta-analysis of existing studies.

Methods: 5 systematic reviews of the topic and 14 trials were reviewed. The 14 primary trials included 7711 patients with 6752 midline incisions. Studies evaluating continuous or interrupted midline laparotomy closure were included. Studies had to have a follow-up of at least 12 months and had to report incisional hernia rates. Secondary outcomes included dehiscence, surgical site infection, and wound pain.

Interventions: Statistical analysis included sensitivity testing for different study populations including elective versus emergency cases. Weighted odds ratios were used to report the effect of the 3 major groups: continuous versus interrupted, absorbable versus non-absorbable, and slow versus rapid absorbable sutures.

Results: The systematic reviews were plagued by poor patient matching regarding type of incision and mixing elective and emergency cases. The most recent review favored interrupted over continuous. The primary studies demonstrated lower hernia rates with continuous (8%) versus interrupted (13%) suturing for elective midline wounds, with an odds ratio of 0.59. Likewise, continuous with slowly absorbing suture (8%) had a lower hernia rate than did midline wounds closed using rapidly absorbing suture (11%), with an odds ratio of 0.65. Nonabsorbable suture had the highest rate of incisional hernia at 26%. Data were inconclusive for emergency procedures. A cumulative meta-analysis showed that information achieved by 1997 was conclusive for a lower hernia rate with continuous suture. Studies did not determine an ideal suture length to wound length ratio. No differences in secondary outcomes were noted.

Conclusions: Elective midline laparotomy wounds have a lower incisional hernia rate when closed with continuous absorbable suture.

Reviewer's Comments: If you use a continuous absorbable suture technique to close your midline elective laparotomy wounds, you will like this paper. It feeds your bias. If you use an interrupted technique or nonabsorbable suture, you will be challenged. The analysis is well done. It is objective and thorough. Use of a cumulative meta-analysis is an interesting twist, trying to demonstrate how long enough data have been available to make a decision and to suggest that no more studies are necessary. This last statement is refreshing, given all the assessments we see recommending more study. Alternatively, the authors agree that the best technique for emergency midline laparotomy cannot be determined from existing data. At the close of day, this report will support some of us and challenge others. The real question is whether the challenge will be great enough to force change. (Reviewer-John A. Weigelt, MD).

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Keywords: Laparotomy Closure, Midline Closure Techniques

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Damage Control in Pancreatic Surgery

Not Just for Trauma Patients: Damage Control Laparotomy in Pancreatic Surgery.

Morgan K, Mansker D, Adams DB:

J Gastrointest Surg 2010; 14 (May): 768-772

Damage control laparotomy techniques can and should be used in major pancreatic operations that go awry.

Background: Damage control laparotomy (DCL) is used in trauma patients who develop intraoperative hypothermia, acidosis, and coagulopathy.

Objective: To review and describe use of DCL in operations on the pancreas.

Design/Methods: Retrospective single-institution review of patients undergoing elective and urgent pancreatic operations who required DCL from 2001-2007.

Results: There were 8 patients with a mean age of 51 years (range, 37 to 65 years) with surgical indications of chronic pancreatitis (n=6), chronic pancreatitis and intrapapillary mucinous neoplasm (n=1), and ampullary cancer (n=1). Index operations included whipple in 4, distal pancreatectomy in 3, and total pancreatectomy in 1. Portal vein hemorrhage was the reason for DCL in 4. The injury site was portosplenic confluence in 2 patients undergoing distals, the anterior neck in the total, and laterally behind the common duct in 1 whipple. Two patients had primary repairs. In the portosplenic confluence injury, a splenic vein patch from the specimen was used for repair. In 1, the portal vein was ligated, and a cadaver iliac vein graft was used. Four patients had DCL at reoperation for abdominal sepsis (n=2) and hemorrhage (n=2). The choledochojejunostomy dehiscence in 1 patient, requiring reoperation on postoperative day (POD) 9. Another patient presented 53 months after whipple with an internal hernia and bowel infarction. A third patient bled from the resection bed on POD 1, and a fourth bled from the splenic artery stump after distal pancreatectomy on POD 3. Operative blood loss was 300 to 12,000 cc and transfusions, 0 to 44 U packed red blood cells. Intraoperative international normalized ratio was 1.43 to 3.3, pH was 7.08 to 7.45, and temperature was 34.8°C to 38.8°C. Re-laparotomy was undertaken 1 to 3 days after DCL in 7, and 3 were reoperated at >1 day (range, 0 to 6). Six underwent fascial closure, while 2 were closed with Vicryl. Morbidity included intra-abdominal abscess (n=6), respiratory failure (n=5), pneumonia (n=2), acute respiratory failure (n=2), venous thromboembolism (n=2), arrhythmia (n=1), or pancreatic or enterocutaneous fistula (n=1 each). Three patients required delayed ventral hernia repair. Length of stay was 7 to 80 days, 5 patients required readmission, and mortality was zero. Hospital charges averaged \$275,627 per patient (range, \$32,363 to \$931,723).

Conclusions: When pancreatic operations result in hemorrhage and sepsis with hypothermia, acidosis, and coagulopathy, DCL principles should be used. DCL can be lifesaving and is an essential tool for the modern pancreas surgeon.

Reviewer's Comments: The triad of death is not unique to trauma patients, and DCL can be extrapolated to any complicated operation when necessary. DCL key principles include knowing (a) when to quit (struggling for several hours and then packing/closing negates DCL benefits), (b) when to take the patient back (not waiting for them to nearly bleed out before believing physical findings), (c) anticipating trouble beforehand (familiarity with anatomic variants, recognizing vascular involvement on preoperative CTs, and having respect for inferior pancreaticoduodenal artery and gastroduodenal artery stumps), and (d) when to complete final closure before losing abdominal domain. (Reviewer-Kathleen Christians, MD).

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Keywords: Damage Control Laparotomy, Pancreatic Surgery

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Laparoscopic Appy Favored Over Open Method in Meta-Analysis of RCTs

Meta-Analysis of Randomized Controlled Trials Comparing Laparoscopic and Open Appendectomy.

Garbutt JM, Soper NJ, et al:

Surg Laparo Endosc 1999; 9 (January): 17-26

Laparoscopic appendectomy advantages over open are less analgesia use, decreased length of stay, and more rapid return to full activities.

Background: Randomized controlled trials (RCTs) comparing laparoscopic to open appendectomy have conflicting results.

Objective: To summarize published knowledge and to determine which technique gives better outcomes.

Methods: A MEDLINE search from 1988 through December 1997 of references using the keywords or text "laparoscopy" and "appendectomy" was conducted, as well as scanning of each bibliography. One author also searched personal files and meeting abstracts. Studies were limited to human and English publications. Eligible studies were RCTs analyzed by intention to treat. Exclusion criteria were as follows: no or inadequate randomization, no original data, population other than acute right lower quadrant pain consistent with appendicitis, <20 patients in each group, and missing relevant outcome data. Difference in outcome between laparoscopic and open was defined as a study effect estimate (negative favors laparoscopic, positive favors open, and zero was no difference).

Results: Of 237 reports, 21 were RCTs, and 11 met all inclusion criteria. Study population size was 50 to 253 patients, with an average of 125 patients each. The laparoscopic technique in 9 studies used endoloops on the mesoappendix and appendiceal stump, and the open technique used a muscle-splitting incision. Average conversion to open rate was 11% (range, 0% to 20%). Average additional incision rate in the open appendectomy was 7%. Two deaths were reported in 1 study, 1 each per treatment group. Five studies concluded no difference between open and laparoscopic methods, while 6 revealed laparoscopic appendectomy to have advantages over open. Advantages noted were less analgesia use, decreased length of stay, and more rapid return to full activities. All reported that the laparoscopic appendectomy took longer. In pooled-effect estimates, a statistically significant difference occurred between procedures for 4 outcomes, 3 favoring the laparoscopic approach. Return to full activity occurred 5 days earlier, postoperative pain at 24 hours was 1.2 points less (scale, 1 to 10), and absolute risk of wound infection was 3% less. The laparoscopic approach increased operating time by 17 minutes.

Conclusions: Pooled results from 11 RCTs comparing laparoscopic and open appendectomy favored the laparoscopic procedure; however, many results failed to reach statistical significance. The definitive answer to whether laparoscopic appendectomy offers better value than open requires a cost-effective analysis.

Reviewer's Comments: Some key outcomes such as rate of reduction of unnecessary appendectomies, benefits in obese patients, and costs were unable to be captured and compared. The pooled studies were statistically heterogeneous (implying significant differences), making it unclear whether it is appropriate to pool their results. Personally, I'm a major fan of the laparoscopic approach, especially in women and obese patients and in those with unclear diagnoses. It's simple, offers great visualization, and gives a more accurate assessment of associated peritonitis/contamination than does the open approach. The operative length can be improved by moving the setup along and pushing the trainee to operate more efficiently. (Reviewer-Kathleen Christians, MD).

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Keywords: Laparoscopic Appendectomy, Meta-Analysis, Randomized Controlled Trials

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Data vs Dogma -- When to Electively Operate in Diverticulitis

Patterns of Recurrence in Patients With Acute Diverticulitis.

Eglinton T, Nguyen T, et al:

Br J Surg 2010; 97 (June): 952-957

The recurrence rate after acute diverticulitis is low, and uncomplicated disease rarely progresses to complications. Caution should be exercised when considering elective surgery for preventing recurrence or development of complications.

Background: The need for elective surgery after an acute episode of diverticulitis is controversial. Recent data on the natural history of diverticulitis suggests that recurrence rates are low and that surgery does not necessarily protect against recurrence, challenging the role of prophylactic surgery following conservatively managed diverticulitis.

Objective: To determine the rate of recurrence, patterns of recurrence, and risk of complications in non-surgically managed patients after both complicated and uncomplicated diverticulitis.

Design: Retrospective chart review.

Methods: All patients admitted with diverticulitis over a 5-year period between 1997 and 2002 were considered. The medical record was reviewed and demographics, management strategy, recurrences, complications, and subsequent surgical intervention were recorded. Complicated diverticular disease was defined as perforation, abscess, stricture, or fistula.

Results: A total of 502 patients with acute diverticulitis were identified. Median age of these patients was 64 years (range, 30 to 94 years); 17.9% were aged <50 years at index admission. Women comprised 58.4% (n=293). Median follow-up was 101 months (range, 60 to 124 months). There were 337 patients (67.1%) with uncomplicated diverticulitis and 165 (32.9%) with complicated diverticulitis. Of those with uncomplicated diverticulitis, 320 (95%) were managed nonoperatively and 75 (23.4%) had a recurrence; 60 (18.8%) had a single recurrence and 15 (4.7%) had >1 recurrence. After an initial attack of uncomplicated diverticulitis, 16 patients (5%) developed complicated disease; complications were abscess in 37.5% (n=6), stricture in 25.0% (n=4), and perforation in 18.8% (n=3); fistula, obstruction, and mesenteric thrombosis each occurred in 1 patient. In patients with complicated disease, complications were mainly abscesses (41.2%, n=68) or perforations (40.6%, n=67) but also included obstruction (5.4%, n=9), fistula (6.7%, n=11), and stricture (6.1%, n=10). Of those patients with complicated disease who were managed nonoperatively, recurrence developed in 24%, and there was no difference in recurrence rate between those with complicated disease and those with uncomplicated disease ($P=0.622$). Recurrences tended to occur within 12 months of the initial episode.

Conclusions: The recurrence rate after acute diverticulitis is low, and uncomplicated disease rarely progresses to complications. Recurrences tend to happen early, suggesting incomplete resolution of the original episode. Caution should be exercised when considering elective surgery for preventing recurrence or development of complications.

Reviewer's Comments: Previous guidelines have recommended elective colectomy after 2 episodes of acute diverticulitis. However, the data presented in this study suggest that the risk of further recurrence was not associated with the number of previous episodes. Furthermore, other studies have found that operating electively after >2 episodes of diverticulitis was more cost-effective and resulted in increased quality-adjusted life-years and fewer complications. As stated by the authors, the number of episodes of diverticulitis alone should not be used as an indication for operation. (Reviewer-Todd Andrew Kellogg, MD).

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Keywords: Acute Diverticulitis, Recurrence Patterns, Complicated, Uncomplicated

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Long-Term Outcomes Similar After Open, Endovascular Aortic Aneurysm Repair

Long-Term Outcome of Open or Endovascular Repair of Abdominal Aortic Aneurysm.

De Bruin JL, Baas AF, et al:

N Engl J Med 2010; 362 (May 20): 1881-1889

Overall survival is similar on long-term follow-up of patients after either endovascular or conventional open repair of large aortic aneurysms. The reintervention rate for endovascular repair is higher and is related to the primary procedure.

Background: Previous studies have demonstrated an overall survival benefit within 2 years after endovascular repair of large aortic aneurysms when compared to conventional open repair. Outcomes in these patients >2 years after the procedure are largely unknown.

Objective: To provide long-term data comparing outcomes of endovascular versus open repair of large (≥ 5 cm) aortic aneurysms.

Design: Long-term, multicenter, randomized controlled trial.

Participants/Methods: A total of 351 patients with abdominal aortic aneurysms ≥ 5 cm in diameter who met criteria for repair for both techniques were randomized to undergo either endovascular or open repair. Emergencies, inflammatory aneurysms, anatomical variations, history of organ transplantation, connective-tissue disease, or life expectancy <2 years as factors were excluded. Follow-up was in the clinic (1, 6, 12, 18, and 24 months), by questionnaire every 6 months after 2 years, and by telephone at 5 years. Primary outcomes were all-cause mortality and freedom from reintervention. Survival was calculated on an intention-to-treat basis.

Results: After randomization, there were 173 endovascular patients and 178 open patients. Mean patient age was 70 years, 91.7% were males, and 43.9% had concomitant cardiovascular disease. There was no significant difference in patient age, gender, comorbid disease, body mass index, ASA class, or cardiovascular medication use between groups. At 6 years, cumulative overall survival rates for open repair and endovascular repair were 69.9% and 68.9%, respectively (95% CI, -8.8 to 10.8; $P=0.97$). There were more deaths <30 days after surgery in the open group and more deaths >30 days postoperatively in the endovascular group. Freedom from reintervention rates at 6 years were 81.9% for open repair and 70.4% after endovascular repair (95% CI, 2.0 to 21.0; $P=0.03$). After open aortic aneurysm repair, the most common reinterventions were repair of incisional hernia; after endovascular repair, reinterventions were endograft-related (eg, endoleak, endograft migration) and their incidence peaked after 5 years.

Conclusions: Long-term follow-up (6 years) of patients after either endovascular or conventional open repair of large aortic aneurysms suggests that overall survival is similar. The reintervention rate for endovascular repair is higher and is generally related to the primary procedure.

Reviewer's Comments: This is a well-designed trial in which no patient was lost to follow-up, and all surviving patients survived at least 5 years. To investigate the durability of endovascular graft placement, it is important to note that problems arising from endovascular graft placement will not likely arise prior to 2 years postoperatively. In fact, the incidence of reinterventions in the endovascular group was clustered around the 5-year mark, which suggests that previous studies with follow-up of ≤ 4 years will have missed graft complications. It should be noted that the authors could not link these complications with survival, which may be a matter of statistical power. (Reviewer-Todd Andrew Kellogg, MD).

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Keywords: Aortic Aneurysm, Open vs Endovascular Repair, Complications, Survival

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Colonic Injuries in War Managed Similarly to Civilian Trauma

Management of Colonic Injuries in the Combat Theater.

Cho SD, Kiraly LN, et al:

Dis Col Rectum 2010; 53 (May): 728-734

Colonic injuries in war are managed similarly to those of civilian trauma. Early complications are similar by mechanism, anatomic location, severity of injury, and management strategy.

Objective: To review the current management of penetrating colorectal injuries in the military, given advances in the civilian arena.

Methods: Records of patients treated at Landstuhl Regional Medical Center between January 2005 and December 2006 were reviewed. Data from the Joint Theater Trauma Registry were also reviewed. These included operative reports, progress notes, in-flight medical transport records, demographic and injury characteristics, blood products received, complications, and management strategy. Complications included ischemia, defined as nonviable bowel requiring further resection or intervention during planned or unplanned exploration, stricture, leak, missed injury, abscess, hematoma, and wound infection. Management strategy was categorized as primary repair, diversion, and damage control strategy with either delayed repair or stoma. Patients undergoing protective ileostomy were included in the diversion group.

Results: 133 patients with penetrating colon injury were identified. Of injuries, 71% were penetrating, 5% were blunt, and 23% were blast injuries; 52% occurred in the sigmoid colon or rectum. The wound was categorized as destructive in 72% of patients. Average injury severity score was 21. Twenty-eight patients had an ascending colon injury, 20 transverse, 28 descending, 36 sigmoid, and 33 rectum/anus/perineum. Forty-three patients underwent primary repair, 59 underwent diversion, and 30 underwent damage control. Complication rates for primary repair were 14%, for diversion 15%, and for the damage control group 30%. Primary repair included direct suture repair in 23 patients and resection and anastomosis in 20 patients. It was performed more often in proximal injuries than in rectosigmoid injuries (48% vs 11%; $P < 0.01$). Similarly, diversion occurred more frequently in rectosigmoid injuries (73% vs 22%; $P < 0.01$). No attempt was made to primarily repair rectal injuries, and 47% of patients who underwent diversion had a rectal injury. Damage control was used with equal frequency throughout the colon. Overall complication rate was 18% and was unrelated to type of initial management. Eight patients in the damage control group underwent anastomosis prior to discharge. Presence of complications was not related to creation of an anastomosis in the damage control group. At the time of discharge, 62% of patients had undergone diversion.

Conclusions: Early complications were similar by mechanism, anatomic location, severity of injury, and management strategy. Damage control surgery for colonic injuries is effective in combat.

Reviewer's Comments: Management of colonic injuries has come full circle. These injuries had a very high mortality in earlier wars, prior to the mandate of colostomy for all wounds. In the 1980s, this dogma was challenged for civilian wounds, so that now the majority of civilian wounds undergo either primary repair or damage control. This has now been translated back to the military, with acceptable outcomes that do not differ by management strategy. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Colonic Injuries, Management, Combat Treatment

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Complicated Appendicitis Does Not Require Operation

A Meta-Analysis Comparing Conservative Treatment Versus Acute Appendectomy for Complicated Appendicitis (Abscess or Phlegmon).

Simillis C, Symeonides P, et al:

Surgery 2010; 147 (June): 818-829

Operation is not the optimal treatment for patients with complicated appendicitis.
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Objective: To report the results of a meta-analysis comparing surgical and nonoperative treatment for patients with appendiceal abscess or phlegmon.

Methods: All databases were searched for relevant articles through June 2008. There were no language restrictions, and all references were searched by hand. Inclusion criteria were studies comparing conservative treatment to acute appendectomy for patients with complicated appendicitis reporting defined outcome measurements. Complicated appendicitis was defined as local or contained perforation with appendiceal abscess or mass. Outcomes compared were length of stay, length of antibiotic therapy, complications, and reoperations. Study quality was assessed by 2 independent assessors using the Newcastle-Ottawa scale.

Results: 74 studies were identified by the initial search strategy; 48 were excluded. Of 26 remaining studies, 3 were subsequently excluded because they included patients with perforated appendicitis and peritonitis, 2 were excluded because the study population comprised patients with acute non-complicated appendicitis, 2 were excluded because the groups of interest were not clearly defined, 1 was excluded because data were not extractable, and 1 was excluded because it was a review of other studies. This left 17 studies included in the analysis, including 16 nonrandomized retrospective studies and 1 nonrandomized prospective study. A total of 1572 patients were included, of which 847 underwent conservative treatment and 725 underwent immediate appendectomy; 483 patients initially undergoing conservative treatment ultimately underwent appendectomy. There was no difference in duration of IV antibiotics between treatment groups, and no difference in length of hospitalization. There was significant heterogeneity in the studies that reported these outcomes. Complications were less common in patients undergoing conservative treatment, with an odds ratio of 0.24. There was also significant heterogeneity in the studies reporting complications. Complications seen more frequently in the group undergoing acute appendectomy included ileus, pelvic abscess, and wound infections. There was no difference in pneumonia, peritonitis, deep vein thrombosis, pulmonary embolism, mortality, adhesions, or fistula. Reoperation was also less common in the conservative treatment group (odds ratio, 0.17).

Conclusions: Conservative management of patients with appendicitis is associated with a decrease in complications and reoperation rates, with a similar overall hospital length of stay.

Reviewer's Comments: This analysis confirms that conservative treatment with IV antibiotics and possibly percutaneous drainage is the optimal treatment for complicated appendicitis. However, there was significant heterogeneity between studies, suggesting that the groups might not be comparable. This is not surprising considering that the majority of studies were nonrandomized retrospective studies. Nonetheless, these data support that nonoperative management should be considered as the most appropriate initial management for patients with complicated appendicitis. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Acute Appendectomy, Conservative Treatment, Meta-Analysis

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Time Necessary for Optimal Informed Consent

Predictors of Comprehension During Surgical Informed Consent.

Fink AS, Prochazka AV, et al:

J Am Coll Surg 2010; 210 (June): 919-926

Time is the most important feature of comprehending information during the surgical consent process.

Objective: To report on the efficacy of "repeat-back" as a strategy to improve comprehension during the surgical consent process.

Methods: 7 Veterans Administration medical centers using computer-aided informed consent (iMedConsent) participated in a randomized controlled trial. Patients scheduled for 1 of 4 elective procedures (total hip arthroplasty, carotid endarterectomy, laparoscopic cholecystectomy, or radical prostatectomy) were randomized to "repeat-back" or standardized consent. The repeat-back feature prompted the provider to ask the patient to describe the diagnosis, procedure, anatomic location, risks, benefits, and alternatives to the proposed procedure. Based on the patient's answers, additional information and education were given. For each procedure, 3 key risks were identified. Understanding of these risks was highlighted during the repeat-back feature. The Rapid Estimate of Adult Literacy in Medicine was used to assess health-related reading ability. Patient comprehension was tested using a questionnaire administered immediately after the consent discussion and was expressed as a percentage of questions answered correctly. Patient anxiety was measured using the short form State-Trait Anxiety Inventory before and after the consent discussion. Race, gender, ethnicity, marital status, education, employment status, age, Short Form Health Survey-12 scores, anxiety scores, health-related literacy, time taken for consent, type of operation, and use of read-back were analyzed for effect on comprehension.

Results: 542 patients participated in the study. In bivariate analysis, race, level of education, employment status, time for consent, type of operation, and use of repeat-back were associated with comprehension. Two multivariate analyses were performed, with and without use of total consent time. In multivariate analysis not including consent time, race, ethnicity, education, age, operation type, and use of repeat-back were significantly associated with comprehension, with an R² value of 0.133. When time for consent was included in the multivariate analysis, repeat-back, education, and operation type were no longer associated with comprehension, and the model explained 18% of the variance. Taking >10 minutes improved comprehension by 7 to 8 points; without including time, repeat-back improved comprehension by approximately 3 points.

Conclusions: Total consent time was the strongest predictor of patient comprehension, and use of repeat-back may enhance comprehension in some patients.

Reviewer's Comments: It appears that formalized processes or programs such as "repeat-back" force the surgeon to take additional time, which, if necessary, does result in the same outcome as if the same amount of time were taken without a forcing process. For those who do take the time (>10 minutes dedicated solely to informed consent), such a process may seem a needless imposition. For those who do not currently spend this time, "repeat-back" may benefit both patients and surgeons. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Informed Consent, Comprehension, Predictors

Print Tag: Refer to original journal article

Bar Coding of Meds Aids Medication Safety

Effect of Bar-Code Technology on the Safety of Medication Administration.

Poon EG, Keohane CA, et al:

N Engl J Med 2010; 362 (May 6): 1698-1707

Use of the bar coding electronic medication administration system substantially reduces the rate of errors in order transcription and in medication administration as well as potential adverse drug events, although it does not eliminate such errors.

Background: Medication errors commonly occur and solutions vary widely. One third of errors occur during ordering, one third during administration, and one third in transcribing and dispensing. Computerized physician order entry addresses the ordering, and bar coding may help prevent administration errors.

Objective: To evaluate the effect of bar coding medications in a large tertiary care hospital.

Design: Before-and-after study as the bar coding technology was introduced into the hospital.

Methods: Over a 9-month period, 6723 medication administrations were observed on units with no bar coding and 7318 administrations on units with bar coding. Two outcomes were defined: errors in timing where the drug was given either early or late by 1 hour and errors not related to timing. Non-timing errors included wrong route, dose error, wrong medication, and wrong directions or monitoring. Research nurses shadowed nurses and reviewed medication orders. Observations were done 2 to 4 weeks before bar coding was introduced and 4 to 8 weeks after it was introduced. All nurses received 4 hours of hands-on training before bar coding was introduced.

Results: Timing errors decreased from 17% without bar coding to 12% with bar coding. Non-timing errors fell from 12% without to 7% with bar coding. Bar coding completely eliminated transcription errors. Significant changes were present on surgical and intensive care units compared to medical units. Bar coding reduced wrong dose errors by 33% and reduced adverse drug events but did not eliminate them.

Conclusions: Bar coding reduces transcription and medication administration errors.

Reviewer's Comments: Bar coding had a positive effect on medication safety in this report. Administration and transcription errors fell but were not eliminated. The authors suggest that imbedding decision support technology into the bar coding system will help reduce errors further. Our hospital uses bar coding and would agree that it helps reduce errors, but it is not the only answer. It can be circumvented as we found in this study, where 20% of drugs given on units with bar coding were given without using the technology. How to resolve this human element remains a concern for any technology. However, this report is promising and probably speaks to the future regarding one technologic step to help reduce medication errors. (Reviewer-John A. Weigelt, MD).

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Keywords: Patient Safety, Bar Coding Technology, Medication Administration

Print Tag: Refer to original journal article

Medical Tx of Chronic Anal Fissure Can Avoid Need for Surgery

Conservative and Surgical Treatment of Chronic Anal Fissure: Prospective Longer Term Results.

Sileri P, Stolfi VM, et al:

J Gastrointest Surg 2010; 14 (May): 773-780

Medical management can achieve a healing in at least 50% of patients with chronic anal fissures, and botulinum injection with fissurectomy or lateral internal sphincterotomy can be used in failures with excellent results.

Background: Medical management of chronic anal fissure avoids surgical complications including incontinence. While incontinence to stool is 0 to 5% after lateral internal sphincterotomy, incontinence to flatus may be as high as 35%. However, recurrence rates are higher with medical management.

Objective: To report the outcomes of various medical and surgical management approaches.

Design: Prospective randomized clinical study.

Participants: 311 consecutive patients.

Methods: A chronic anal fissure was defined by symptoms lasting >3 months, presence of a skin tag, sentinel pile, or fibrosis along the fissure margins. Patients were randomized to either 0.2% nitroglycerin ointment (189) or anal dilators (122) for an 8-week treatment course. Patients failing to heal at 8 weeks were crossed over to the other treatment or a combination of treatment for 4 more weeks. Patients who were not healed after this 12-week treatment course were offered fissurectomy and botulinum toxin injection or lateral internal sphincterotomy (LIS). The primary end point was healing of the anal fissure. Recurrence rates were also followed.

Interventions: Medical treatment was given twice daily and dilator therapy progressed to a 30-mm anal dilator.

Results: Nitroglycerin only produced a healing rate of 55% and dilators a rate of 61%, which was not significantly different. After the crossover treatment period, total success rates for initial nitroglycerin patients were 58% and 75% for dilator patients, which was a significant difference. Recurrence rates for nitroglycerin alone were 23% and for dilators 9%, which was statistically different. A total of 101 patients were offered surgical therapy for non-healing fissures. Thirty patients had botulinum injections with a cure rate of 83%. Recurrence occurred in 3 patients (10%). LIS was performed in 72 patients with a 99% healing rate. Recurrence occurred in 1 patient and no incontinence was reported.

Conclusions: Medical management can achieve a healing in at least 50% of patients with chronic anal fissures, and botulinum injection with fissurectomy or LIS can be used in failures with excellent results.

Reviewer's Comments: This is a very well done study with a difficult group of patients. The 12-week medical regimen achieved a 50% to 75% cure rate, but I wonder if this prolonged treatment regimen would be tolerated among patients in the U.S. My experience with patients with a chronic anal fissure is that they have been ill for a while before they see a surgeon and want something done as soon as possible. Coaxing them into a 12-week course of twice daily treatments is not easy. Alternatively, this study does offer hope for at least 50% of patients who wish to avoid surgical therapy. It also demonstrates that LIS can be performed safely with acceptable incontinence and recurrence rates. Our approach to a patient with a chronic anal fissure is usually botulinum injection or LIS. (Reviewer-John A. Weigelt, MD).

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Keywords: Anal Fissure, Medical & Surgical Management

Print Tag: Refer to original journal article

Splenic Pseudoaneurysm Occur in Few Patients After Blunt Trauma

Computed Tomography Identification of Latent Pseudoaneurysm After Blunt Splenic Injury: Pathology or Technology?

Weinberg JA, Lockhart ME, et al:

J Trauma 2010; 68 (May): 1112-1116

Improved scanning devices did not increase the number of pseudoaneurysms detected, and their presence was not associated with splenic injury grade.

Background: CT imaging is used to identify injury after blunt abdominal trauma. Splenic injuries are graded by CT findings and some trauma programs employ follow-up CT scans to monitor the splenic injury.

Pseudoaneurysm within the spleen is one finding on CT imaging. These pseudoaneurysms can be discovered initially (early) or on the follow-up CT scan (latent).

Objective: To assess the ability of different scanners to detect splenic pseudoaneurysms after blunt splenic injury.

Design: Retrospective review.

Participants: 411 patients managed nonoperatively with a blunt splenic injury over a 4.5-year period.

Methods: 2 different scanners were used. In total, 135 patients were evaluated with a 4-slice and 276 patients were evaluated with a ≥ 16 -slice machine. The incidence of early and late pseudoaneurysms was correlated with the scanner and the grade of splenic injury.

Interventions: All patients had a scan on admission and at 24 to 48 hours after admission.

Results: The 4-slice scanner identified 5 early (4%) and 3 latent (2%) pseudoaneurysms. The ≥ 16 -slice scanner identified 13 early (5%) and 8 latent (3%) pseudoaneurysms. The pseudoaneurysms were not related to the grade of splenic injury. Ten of 18 early pseudoaneurysms were studied with angiography and 7 were embolized; 2 had a normal study and 1 patient had a splenectomy. Among the 8 other patients, 5 had a splenectomy and 3 were embolized, and 2 of these 3 required a splenectomy for a splenic abscess. Latent pseudoaneurysms were managed by splenectomy (6), angioembolization (4), and observation (1).

Conclusions: Improved scanning devices did not increase the number of pseudoaneurysms detected and their presence was not associated with splenic injury grade.

Reviewer's Comments: Splenic pseudoaneurysms are an emotional topic along with follow-up CT scans. The authors feel these vascular abnormalities are important and treat them fairly aggressively. They suggest that better imaging devices do not alter their incidence, suggesting they are part of the pathophysiology of a splenic injury. This conclusion is used to support their treatment approach. Our approach is to not treat splenic pseudoaneurysms, but to treat the patient's hemodynamics. We also do not routinely use angiography or do follow-up scans. Given the 2 patients in this series that had embolization and then required a splenectomy for splenic abscess, I believe we will continue to do what we are doing. (Reviewer-John A. Weigelt, MD).

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Keywords: Splenic Trauma, CT Scan, Latent Pseudoaneurysm

Print Tag: Refer to original journal article

Rectal, Sigmoid Tumors -- Are They Equal?

Does a Rectal Cancer of the Upper Third Behave More Like a Colon or a Rectal Cancer?

Rosenberg R, Maak M, et al:

Dis Colon Rectum 2010; 53 (May): 761-770

Cancers of the upper third rectum have more similarity with rectal cancer of the middle third rectum than with sigmoid cancer.

Background: No randomized studies compare treatment of upper third rectal (UTR) cancers, middle third rectal (MTR) cancers, and sigmoid (S) cancers, and recommendations vary between countries.

Objective: To determine whether cancers of the UTR should be treated according to colon or rectal cancer guidelines.

Methods: Between 1990 and 2006, sigmoid tumors, UTR, and MTR with International Union Against Cancer (UICC) stage II or III who underwent radical resection without preoperative radiochemotherapy were analyzed. After 1997, 135 patients with UTR or MTR cancer stage cTx or T3/4NxM0 and treated with preoperative radiochemotherapy were excluded. Mesorectal excision (MRE) was done from 1990 onward. Partial MRE was done for primary tumors of the UTR and total MRE in MTR. UICC stage III sigmoid cancer received adjuvant chemotherapy. Stage II or III rectal cancer received adjuvant radiochemotherapy. Tumor recurrence, deaths, and cause-specific survival (CSS) were assessed.

Results: Of 499 patients, there were 299 sigmoid, 95 UTR, and 105 MTR cancers. UICC stage II was found in 252 and stage III in 247. R0 resection rate was 98.2% and nodes resected 20.0 ± 9.7 . Sigmoid cancers presented with higher T stage, preoperative ileus, and tumor stenosis. Anastomotic leakage was significantly lower in sigmoid versus rectal cancer (5.7% S vs 11.6% UTR vs 12.4% MTR). Sigmoid cancer had better estimated CSS (5-year $83.6\% \pm 4.7\%$) versus UTR ($74.3\% \pm 9.6\%$) or MTR (5-year $73.4\% \pm 9.2\%$). Of 103 patients who died of recurrence, 34 were tumor-related deaths at <2 years and 91 occurred at <5 years. Tumor location, grade, T/N category, operative year, and residual tumor status were independent prognostic parameters of CSS. Cancers of UTR and MTR had an increased cause-specific death (UTR: HR, 1.87; $P = 0.007$; MTR: HR, 1.43; $P = 0.002$) compared with sigmoid. UTR were divided into subgroups by grade, T stage, and N stage (1 point, 5-year CSS $90.7\% \pm 4.5\%$ vs 2 points $57.4\% \pm 9.6\%$ vs 3 points $50.9\% \pm 15.8\%$ ($P < 0.001$)). **Discussion:** T3/4 or N+ UTR cancers are believed to be better treated as colon cancer with primary resection and not as rectal cancer with radiochemotherapy, but few supporting data exist. Tumor location was an independent prognostic factor for CSS unassociated with biologic factors. Sigmoid cancers were more advanced than rectal, but a cut-off between UTR and MTR could not be drawn to define different treatment strategies based on location.

Conclusions: UTR cancers are more similar to MTR cancers than sigmoid cancers. A UTR cancer subgroup may require more aggressive therapy than primary resection and adjuvant therapy.

Reviewer's Comments: A concurrent preoperative radiochemotherapy trial automatically excluded 135 patients from analysis and MRE was just being introduced, both potentially skewing the data. While a UTR cancer high-risk group was identified, it was lost in the details. One study merit was a thorough literature review on the topic. (Reviewer-Kathleen Christians, MD).

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Keywords: Rectum, Sigmoid, Cancer

Print Tag: Refer to original journal article

Frailty Index Improves Predictions of Surgical Outcomes in the Elderly

Frailty as a Predictor of Surgical Outcomes in Older Patients.

Makary MA, Segev DL, et al:

J Am Coll Surg 2010; 210 (June): 901-908

The frailty index strengthens the predictive ability of other operative risk models and can help inform clinical decisions.

Background: Frailty is a phenotype of physiologic reserves and resistance to stressors associated with adverse outcomes.

Objective: To determine whether frailty predicts operative risk in older patients and whether adding frailty to other risk models enhances ability to identify patients at risk for complications.

Design/Participants: Prospective study of patients aged >65 years evaluated for elective surgery from June 2005 to July 2006.

Methods: Frailty was based on a validated scoring system including: (1) weight loss, (2) decreased grip strength, (3) exhaustion, (4) low physical activity, and (5) slow walking speed. Confounding variables included: age, race, gender, comorbidities, cancer procedure, preoperative residence, and procedure specifics. Four risk models (frailty index, ASA, Lee's revised cardiac index, and Eagle score) were evaluated. Dependent variables were surgical complications <30 days, length of stay (LOS), and discharge to a skilled or assisted care facility.

Results: Of 594 participants, 62 were frail, 186 (31.3%) were intermediately frail, and 346 (58.3%) were non-frail. Frailty was an independent predictor of surgical complications. Intermediately frail had 2.06 times higher odds of complications versus frail with 2.54 times higher odds compared to non-frail. Odds ratios for intermediately frail was 1.78 to 3.13 and for frail, 2.48 to 3.15. Predictive ability of models without frailty were 63% (ASA score), 62% (Lee score), and 8% (Eagle score), increasing to 70%, 67%, and 71%, respectively, adding frailty ($P < 0.01$). Mean LOS after minor procedures was 0.7 days for non-frail, 1.2 days for intermediate, and 1.5 days for frail patients versus 4.2 days for non-frail, 6.2 days for intermediate, and 7.7 days for frail patients after major procedures. The incidence of discharge to a skilled or assisted-living facility after minor procedures was 0.8% in non-frail, 0% for intermediate, and 17.4% for frail; after major procedures, 2.9% for non-frail, 12.22% for intermediate, and 42.11% for frail. Frailty independently predicted the odds of being discharged to a skilled or assisted-living facility (intermediate or frail, 3.16-fold higher odds). Predictive abilities without frailty were 71% (ASA), 67% (Lee), and 66% (Eagle) and increased to 81%, 80%, and 76%, respectively, when adding frailty to the risk prediction ($P < 0.01$).

Conclusions: Frailty is common in older patients and independently associated with greater risk for postoperative complications, increased LOS, and discharge to an assisted or skilled nursing facility. The frailty index strengthened the predictive ability of other operative risk models. Broad use can help inform clinical decisions.

Reviewer's Comments: Authors only evaluated short-term outcomes and laboratory values were not included. Providers were also blinded to frailty results, thus the impact of this knowledge on care is unknown. Having said that, the study quantifies complete surgical risk and could be quite useful to determine whether a borderline patient will survive an operation while maintaining their quality of life. (Reviewer-Kathleen Christians, MD).

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Keywords: Frailty Index, ASA Score, Lee & Eagle Scores, Risk

Print Tag: Refer to original journal article

Direct Peritoneal Resuscitation May Lessen Time to Definitive Fascial Closure

Direct Peritoneal Resuscitation Accelerates Primary Abdominal Wall Closure After Damage Control Surgery.

Smith JW, Garrison RN, et al:

J Am Coll Surg 2010; 210 (May): 658-667

The addition of adjunctive direct peritoneal resuscitation to the damage control strategy shortens the interval to definitive fascial closure without affecting overall resuscitation volumes.

Background: Direct peritoneal resuscitation involves use of a hypertonic glucose solution in the peritoneal cavity. Effects include microvascular vasodilation, increased visceral blood flow, reversal of endothelial dysfunction, and improved survival when done concomitantly with intravenous resuscitation.

Objective: To investigate the effect of direct peritoneal resuscitation on abdominal wall closure in patients undergoing damage control surgery.

Methods: Records of all patients admitted between January 1, 2004, and June 30, 2008, with hemorrhagic shock who underwent damage control surgery were reviewed. Twenty patients undergoing direct peritoneal resuscitation were matched to 40 controls by Injury Severity Score (ISS), age, gender, mechanism of injury, initial blood pressure, and initial pH. As no patient undergoing direct peritoneal resuscitation had a head Abbreviated Injury Score >3, no controls with severe head injury were chosen. In patients undergoing direct peritoneal resuscitation, fluid was instilled via a catheter placed in the left upper quadrant that had been directed into the pelvis. The fluid rate was 1.5 cc/kg/hour; rate and type of intravenous fluid resuscitation was not standardized.

Results: 1 patient in the peritoneal resuscitation group died of uncontrolled pelvic hemorrhage and was excluded. The only baseline difference in the groups was a higher international normalized ratio in the peritoneal resuscitation group (1.7 vs 1.4; $P=0.03$). Average ISS was >30 in both groups. Patients received an average of 23 to 25 liters of fluid in the first 24 hours, and received 22 to 27 units of blood products. There were no differences in mortality (12.5% in the control group, 10.5% in the peritoneal resuscitation group), hospital, or ICU length of stay between groups. Patients in the peritoneal resuscitation group were closed in 4.4 days compared to 7.0 days ($P<0.05$). Primary fascial closure was achieved in 90% of patients in the peritoneal group compared to 60% of patients in the control group ($P<0.01$). Intraabdominal complications and hernia were much more likely in the control group as well, although overall complications were equal between groups.

Conclusions: Peritoneal resuscitation shortens time to definitive fascial closure in patients managed with damage control surgery, lessening intraabdominal complications.

Reviewer's Comments: The authors hypothesize that the effect of the direct peritoneal resuscitation that allows earlier fascial closure is to decrease visceral edema. The same effect has been hypothesized with use of the commercial wound VAC, as well as with the use of intravenous hypertonic resuscitation. Direct comparison of any of these methods to standard management of the open abdomen is necessary to show causation rather than association, but any method to achieve primary fascial closure earlier is likely to result in fewer intraabdominal complications. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Peritoneal Resuscitation, Abdominal Wall Closure, Damage Control Surgery

Print Tag: Refer to original journal article

A Gap Between Evidence, Clinical Practice

Evidence-Based Surgical Practice in Academic Medical Centers: Consistently Anecdotal?

Melis M, Karl RC, et al:

J Gastrointest Surg 2010; 14 (May): 904-909

Evidence-based medicine does not appear to uniformly influence clinical decision-making.

Background: Randomized clinical trials are the highest level of clinical evidence, with meta-analyses and guidelines also forming a solid basis for evidence-based clinical decisions.

Objective: To evaluate the use of this high-level evidence by surgeons in academic practice.

Methods: Faculty, fellows, and residents at 3 academic institutions were surveyed using a 13-item questionnaire related to gastrointestinal surgery. The 13 items all had correct answers based on Level I evidence. Questions had 4 possible responses: never or rarely were grouped together, as were often and always. Analysis was performed by year of training and by institution.

Results: 110 surgeons completed the survey, for a 79% response rate. There were 58 senior residents or fellows, 31 junior residents, and 21 faculty. Overall, 60% of the answers were in agreement with the best scientific evidence, with no difference by year of training/experience and no difference by institution. The question with the least agreement related to performing handsewn anastomoses for colorectal anastomoses (6% agreement), followed by a similar question about small bowel resection (15% agreement); this was followed by a question on use of polyethylene glycol for bowel prep (28% agreement; prep should not be done) and allowing enteral feeding on the first post-laparotomy day (35% agreement with allowing early enteral feeding). The question with the greatest agreement asked about use of an abdominal drain after right colectomy (95% did not) followed by use of the Shouldice repair (90% did not use this approach). This was followed by obtaining a chest x-ray prior to operating on a 25-year-old male for appendicitis (87% correctly did not). The overall percentage of answers that agreed with the evidence was similar to a 2004 French survey, although there was significant difference in the agreement with specific questions.

Conclusions: Evidence-based medicine does not appear to uniformly influence clinical decision-making.

Reviewer's Comments: There is clearly variability in the quality of evidence for the different questions, particularly those at the opposite extremes (those with little agreement and those with significant agreement). However, even without the potentially controversial questions there is clearly a gap between best evidence and current practice. The differences between the current study and the prior French study point even more clearly to local practice and anecdotal experience being the primary guide to practice. (Reviewer-Karen J. Brasel, MD, MPH).

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Keywords: Evidence-Based Practice, Clinical Decision Making

Print Tag: Refer to original journal article

Antibiotics for Cervical Endocrine Surgery -- To Give or Not to Give?

Patterns of Antibiotic Prophylaxis Use for Thyroidectomy and Parathyroidectomy: Results of an International Survey of Endocrine Surgeons.

Moalem J, Ruan DT, et al:

J Am Coll Surg 2010; 210 (June): 949-956

The use of pABX for cervical endocrine operations is variable, particularly among practice settings, and prescribing behavior appears to follow dogma.

Background: Thyroidectomy and parathyroidectomy are classified as "clean" cases. As such, antibiotic prophylaxis (pABX) is not generally indicated. However, in practice, patterns vary considerably.

Objective: To determine usage patterns and factors influencing prophylactic antibiotic use or non-use for thyroid and parathyroid operations.

Design: Internet-based survey.

Methods: An Internet-based survey was distributed to all members of the American and International Associations for Endocrine Surgeons. Frequency of antibiotic administration was defined as follows: <10%, rarely; 10% to 40%, 40% to 60%, and 60% to 90%, sometimes; and >90%, almost always. Also, the hospital records at a tertiary care teaching hospital were reviewed for 30-day readmissions and reoperations due to severe surgical site infections (SSI) after thyroidectomy, parathyroidectomy, or neck dissections over an 8-year period.

Results: 275 responses were received for a response rate of 57.1%. Practice settings were: university hospital in 68.8% (n=181); affiliate hospital in 17.1% (n=45); and community hospital in 16% (n=42). Of these responses, 62.0% reported that they prescribed pABX for thyroidectomy or parathyroidectomy "almost never" or <10% of the time; 26.2% reported that they prescribed pABX "almost always" or >90% of the time; 6.1% responded prescribing pABX "rarely" or 10% to 40% of the time; 1.5% reported using pABX "sometimes" or 40% to 60% of the time; and 3.8% reported using pABX "usually" or 60% to 90% of the time. University surgeons were less likely than community surgeons to "almost always" use pABX (21.7% vs 47.2%; $P=0.04$). In fact, community hospital surgeons were more likely to use pABX than surgeons in affiliated or university hospitals (49.6% vs 31.8% and 24.5%, respectively ($P=0.04$). Surgeons in Asia were more likely to "almost always" use pABX (58.3%) compared to surgeons in the U.S. (27.9%) and Europe (8.8%); $P=0.0001$. There was no association between caseload and prescribing practice ($P=0.21$); past experiences with SSI, either minor ($P=0.33$) or severe ($P=0.83$) SSIs; or antibiotic adverse reactions ($P=0.78$). Readmission for infections occurred for 5 of 4541 patients (0.11%) who underwent cervical operations. Most surgeons (68%) would choose not to have pABX if they, themselves, needed a cervical operation.

Conclusions: Infections after endocrine cervical operations are rare. The use of pABX for cervical endocrine operations is variable, particularly among practice settings. Prescribing behavior appears to follow dogma.

Reviewer's Comments: Although published guidelines do not support the use of pABX, it is clear from this survey that surgeons are not generally compliant. This is not a new phenomenon; a recent study showed that U.S. surgeons are largely noncompliant with CDC recommendations with respect to the use of perioperative antibiotics for vascular, cardiac, orthopedic, colorectal, or gynecologic procedures. This is perplexing; educated professionals should be willing to change their clinical practice when the science demonstrates a benefit, or not. (Reviewer-Todd Andrew Kellogg, MD).

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Keywords: Thyroid, Parathyroid, Surgery, Antibiotic Prophylaxis, Infection, Surgical Site Infections

Print Tag: Refer to original journal article

Morbidity But Not Mortality Increased in Diabetics Undergoing Noncardiac Surgery

Overt Diabetes Mellitus Adversely Affects Surgical Outcomes of Noncardiovascular Patients.

Bower WF, Jin L, et al:

Surgery 2010; 147 (May): 670-675

Diabetic patients have lower hemoglobin preoperatively and are more likely to require intraoperative blood transfusions.

Background: Compared to nondiabetic cardiac surgery patients, those with diabetes have increased perioperative morbidity and mortality. Whether this phenomenon holds true for other noncardiac specialties is largely unknown.

Objective: To determine the association between diabetes mellitus and postoperative complications in noncardiac surgery patients.

Design: Retrospective review of a prospectively maintained database.

Methods: Consecutive cases that involved at least a skin incision seen between 2006 and 2009 were included. Cancellation of operation was the only exclusion criteria. The diagnosis of diabetes mellitus was made according to the American Diabetes Association definition. Data sets from various surgical subspecialties were reviewed to determine the prevalence of diagnosed diabetes, the incidence of perioperative complications, and the overall morbidity and mortality. Diabetic and nondiabetic patients were compared. Stratification was performed by operation for malignancy or nonmalignancy.

Results: 1343 data sets included 522 cardiac, 386 colorectal cancer, 59 head and neck cancer, 99 hepatectomy, 102 thoracic, 87 thyroid, and 88 vascular procedures. Male patients comprised 66% of patients. Mean age was 61.6 years (range, 16 to 94). Procedures were nonemergent in 75%. Overall, 25% of patients had known diabetes. Logistic regression identified age >70 years (OR, 10.0; $P=0.031$), intraoperative blood transfusion (OR, 7.1; $P=0.002$), and number of postoperative complications (OR, 1.4; $P=0.028$) as predictors of mortality. There was no association of mortality with diabetes. Intraoperative complications occurred during 2.9% of operations. There was no significant difference in incidence of intraoperative events between known diabetics (3.2%) and nondiabetics (2.8%). More diabetics required intraoperative blood transfusion than nondiabetic patients (34% vs 26%; $P=0.003$) and mean preoperative hemoglobin was lower than nondiabetics ($P=0.001$). Morbidity was higher in diabetic patients (43%) compared to nondiabetic patients (36%) ($P=0.035$), and morbidity was associated with the diagnosis of diabetes on univariate analysis ($P=0.035$). Overall morbidity was increased by a factor of 2.0 in diabetic patients with malignancy and by 1.6 in diabetic patients without malignancy compared to patients without diabetes.

Conclusions: Morbidity but not mortality is increased in patients with diabetes undergoing noncardiac surgery. Diabetic patients have lower hemoglobin preoperatively and are more likely to require intraoperative blood transfusions.

Reviewer's Comments: This study verifies the perioperative association between known diabetes and the occurrence of complications after noncardiac surgery. The prevalence of prediabetic and undiagnosed conditions is high and ever increasing. Thus, the strength of associations between glucose dysregulation and operative outcomes may be even greater than is reported here. (Reviewer-Todd Andrew Kellogg, MD).

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Keywords: Diabetes, Non-Cardiac Surgery, Complications, Morbidity, Mortality, Malignancy

Print Tag: Refer to original journal article

Anal Fistula Plug Outcomes

Long-Term Outcomes With the Use of Bioprosthetic Plugs for the Management of Complex Anal Fistulas.

Ellis CN, Rostas JW, Greiner FG:

Dis Colon Rectum 2010; 53 (May): 798-802

Bioprosthetic plugs appear to be effective treatment for the long-term closure of complex fistulas-in-ano. Retreatment after initial plug failure has a low success rate.

Background: There is an increased risk of incontinence with the treatment of complex fistulas. To minimize these risks, sphincter-preserving techniques have been proposed such a bioprosthetic plug (lyophilized porcine submucosa). However, long-term outcomes are unknown.

Objective: To determine the long-term outcomes of patients with anal fistulas managed using bioprosthetic plugs.

Design: Retrospective review of a prospectively maintained database.

Participants/Methods: Patients with anal fistulas managed using a bioprosthetic plug (Cook Surgical Inc) were included in the analysis. Data gathered included demographics, fistula anatomy and etiology, previous repairs, comorbidities, procedure performed, and fistula recurrence. Follow-up was by clinic visit or telephone interview. Absence of a residual fistula tract without drainage was interpreted as clinical healing.

Results: 63 patients with complex anal fistulae were consecutively treated with a bioprosthetic anal fistula plug, with a minimum follow-up of 1 year from the last treatment. There were 44 men and 19 women. Mean age was 46 years (range, 22 to 68). There were 63 transsphincteric and 12 ano-vaginal fistulas. A draining seton was used for at least 6 weeks in 60 (95.2%) patients. A total of 78 anal fistula plugs were used in these patients and 51 (81%) were successfully healed with this intervention. After a minimum follow-up of 12 months (range, 12 to 24), a single plug placement provided successful treatment in 48 (76%) patients. Fifteen patients experienced 27 plug failures; 1 patient had early plug extrusion considered a technical failure and replacement of the plug was successful. Ten patients had a primary failure defined as non-healing without plug extrusion; 6 of these had posterior fistulas and 1 had an ano-vaginal fistula. Seven of these 10 patients were male, 4 had Crohn's disease, and 8 smoked tobacco -- none of these 10 patients had successful healing with repeat plug placement. Late failure, defined as healing followed by recurrence, occurred in 4 patients. Of these 4 patients, 3 had posterior fistulas and 1 had an ano-vaginal fistula, 3 were male, 1 had Crohn's disease, and 3 smoked tobacco. After initial failure, subsequent bioprosthetic plug placement was successful in 3 of 15 (20%). Posterior fistula, tobacco smoking, and a history of previous plug failure were predictive of failure of the bioprosthetic plug by multivariate analysis.

Conclusions: Bioprosthetic plugs appear to be effective for long-term closure for the treatment of complex fistulas-in-ano.

Reviewer's Comments: There has been a lot of enthusiasm for the use of bioprosthetic anal fistula plugs in the last 2 years. Most of the generated data are not from randomized studies and tend to be quite variable. However, most seem to suggest fairly modest success rates. A randomized study with standardized techniques is imperative. (Reviewer-Todd Andrew Kellogg, MD).

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