

Acute Abdominal Complications Following Hip Surgery

B. Deleanu¹, R. Prejbeanu¹, D. Vermesan¹, H. Haragus¹, I. Icmă², V. Predescu³

¹IstDepartment of Orthopedics and Trauma, "Victor Babeș" University of Medicine and Pharmacy Timișoara, Romania

²IstDepartment of Surgery, "Victor Babeș" University of Medicine and Pharmacy Timișoara, Romania

³"Sf. Pantelimon" Department of Orthopedics and Trauma, "Carol Davila" University of Medicine and Pharmacy Bucharest, Romania

Rezumat

Complicații abdominale acute în chirurgia șoldului

Chirurgia șoldului este una dintre cele mai frecvente și favorabile proceduri ortopedice. Deși rare, complicațiile abdominale apar și sunt asociate cu evoluție nefavorabilă. Am dorit să identificăm și să descriem complicațiile abdominale severe ce apar imediat postoperator la pacienții cu proceduri traumatice și elective ale șoldului. Analiza retrospectivă pe patru ani a bazei de date electronice a găsit 408 artroplastii primare de șold, 51 de revizie și 1040 de fracturi ale femurului proximal. Dintre aceștia, 3 bărbați și 4 femei cu vârsta între 64 și 84 de ani, au prezentat complicații abdominale la 3-10 zile de la operația ortopedică inițială: ulcer acut perforat (3), colacistită acută (2), volvulus (1), megacolon toxic cu peritonită (1) și ileus dinamic (1). Complicațiile abdominale perioperatorii sunt rar întâlnite în secțiile de ortopedie generală. Însă când apar, sunt aproape exclusiv la pacienți cu patologie de șold, tratați și duc în evoluție la situații cu risc vital. Subliniem necesitatea ca aceste situații să fie rapid identificate atât de către chirurgii ortopezi cât și cei generaliști. Astfel se poate asigura un management eficient care să îmbunătățească siguranța pacienților.

Cuvinte cheie: artroplastie șold, fractură femur proximal, complicații perioperatorii, pseudo-ocluzie colonică, abdomen acut

Abstract

Hip surgeries are some of the most common and successful orthopedic procedures. Although rarely, abdominal complications do occur and are associated with unfavorable outcomes. We aimed to identify and describe the severe abdominal complications that appear in patients under-going elective or traumatic hip surgery. A four year retrospective electronic database research identified 408 elective primary hip replacements, 51 hip revisions and 1040 intra and extracapsular proximal femur fractures. Out of these, three males and 4 females between 64 - 84 years old were identified to have developed acute abdominal complications: perforated acute ulcer (3), acute cholecystitis (2), volvulus (1), toxic megacolon with peritonitis (1) and acute colonic pseudo-obstruction (1). Complications debuted 3 - 10 days after index orthopedic surgery. Acute perioperative abdominal complications are rarely encountered during orthopedic surgery. When these do occur, they do so almost exclusively in patients with hip pathology, comorbidities and most often lead to life-threatening situations. We thus emphasize the need for early identification and appropriate management by both orthopedic and general surgery doctors in order to improve patient safety.

Corresponding author:

Haragus Horia, MD
Ist Clinic of Orthopedics and Trauma
Emergency Clinical County Hospital
10 Iosif Bulbuca Blvd, 300736, Timișoara
Romania
E-mail: horia.haragus@yahoo.com

Key words: hip arthroplasty, proximal femoral fracture, perioperative complications, colonic pseudo-obstruction, acute abdomen

Introduction

Hip surgeries are one of the most common and successful orthopedic procedures. The patients generally comprise of two categories: elective total joint replacements for osteoarthritis and geriatric proximal femoral fractures due to osteoporosis. Hip arthroplasty is the current golden standard in terms of joint replacement outcomes. It addresses elderly but active patients which require mobility improvement. On the other hand, patients with proximal femoral fractures are frail, with multiple comorbidities and require surgery to regain the ability to perform activities of daily living. In addition, these cases are often already emaciated and dehydrated by the time they are admitted to hospital (1).

Of the few general complications of orthopedic hip surgery, most are cardiovascular (arrhythmic, ischemic), neurologic (delirium, stroke), thromboembolic events or upper gastrointestinal bleeding (2). Although rare, abdominal complications do occur and are associated with unfavorable outcomes and death (3). Given these premises we aimed to identify and describe the severe abdominal complications that appear perioperatively in patients undergoing elective or traumatic hip surgery.

Material and Method

We performed a four year (December 2009 – December 2013) review of our orthopedic clinic electronic database in order to identify patients with acute abdominal complications. The patient's charts were then further investigated for complications which debuted in the immediate postoperative period and required emergency surgical treatment. Out of a total of 9,268 patients admitted in our clinic 408 were elective primary hip replacements, 51 hip revisions and 1,040 fractures

(64 pelvic, 475 femoral neck and 501 pertrochanteric). During this period there were 42 deaths (excluding those transferred to other departments), out of which 34 had hip pathology (22 for pertrochanteric fractures).

Results

Three males and 5 females between 64 - 84 years old were identified to have had: acute ulceration with perforation (3), acute cholecystitis (2), volvulus (1), toxic megacolon with peritonitis (1) and acute colonic pseudo-obstruction (1). Only the 2 cholecystectomies and the dynamic ileus survived. Complications debuted 3 – 10 days after index orthopedic surgery. Our single center case series summary can be found in Table 1.

Case 1: A 71 year old male with right hip cemented acetabular cup loosening and protrusion was admitted for revision. The medical history identified bilateral hip and right knee arthroplasties and abdominal surgery with visible scarring. Three months prior, revision of the right hip was unsuccessful with recurrent dislocations and secondary replacement of both acetabular and femoral components was performed. The surgery went uneventful and an uncemented Zimmer jumbo cup with straight Revitan femoral stem was implanted. On the fourth postoperative day the patient started to experience nausea, diffuse abdominal distention with pain and vomiting. The symptoms worsened over the following three days and repeated enemas failed to restore normal bowel transit. Abdominal X-ray (Fig. 1) revealed multiple hydroaeric levels with small intestine distention. Emergency surgery was performed on the seventh postoperative day. Intraoperatively, in the right iliac fossa there was a block of bowel adhesions with ileal loop volvulus over an enteroparietal adhesion, obstruction and intestinal distention.

Table 1. Summary of our single center case series of perioperative orthopedic surgery acute abdominal complications

Case	Age	Gender	Orthopedic surgery	Acute abdomen cause	Days from index surgery	Approach	Relevant history	Final outcome
1	71	Male	Revision arthroplasty	Volvulus	7	Open	Prior abdominal open surgery with scarring	Death
2	80	Female	Femoral neck fracture / hemiarthroplasty	Acute bulbar ulceration with perforation	10	Open	Multiple comorbidities	Death
3	73	Female	Pertrochanteric fracture / osteosynthesis	Acute cholangitis	7	ERCP /Laparoscopic	N/A	Recovered
4	84	Female	Pertrochanteric fracture / osteosynthesis	Acute anastomosis ulceration with perforation	3	Open	Gastric resection / Pean anastomosis	Death
5	66	Male	Subtrochanteric fracture / osteosynthesis	Toxic megacolon with peritonitis	6	Open	N/A	Death
6	83	Female	Femoral neck fracture / hemiarthroplasty	Acute gastric ulceration	N/A	Open	Multiple comorbidities	Death
7	64	Male	Total hip replacement	Acute colonic pseudo-obstruction	5	Open	N/A	Recovered
8	78	Female	Femoral neck fracture / hemiarthroplasty	Acute lithiasic cholecystitis	5	Laparoscopic	N/A	Recovered



Figure 1. Multiple hydroaeric levels with predominantly small intestine distention, consistent with intraoperative volvulus over adhesions (Case 1)



Figure 2. Pneumoperitoneum and colonic distention (Case 2)



Figure 3. Pertrochanteric fracture operated with GammaNail (Stryker)

Reduction of the volvulus, lysis of adhesions and retrograde bowel milking and was performed. Five days after the abdominal surgery, the patient developed an evisceration. Secondary surgery performed ileocolic anastomosis, cure of the evisceration and abdominal wall reconstruction with polypropylene mesh. The patient had consecutive complications and repeated surgeries over the next 16 days and eventually died.

Case 2: An 80 year old female with multiple comorbidities suffered a femoral neck fracture and underwent hemiarthroplasty surgery 6 days later. On the tenth postoperative day she developed painful distended abdomen with altered general status (Fig. 2). Emergency celiotomy identified biliary fluid in the peritoneal cavity and perforated acute duodenal ulcer. The postoperative evolution was unfavorable, with pneumonia and respiratory insufficiency. Three weeks later she had an episode of upper gastrointestinal bleeding and the status quickly worsened.

Case 3: A 73 year old female with pertrochanteric fracture was operated on 4 days after hospital admission (Fig. 3). Seven days after the surgery she developed fever, jaundice and right upper quadrant abdominal pain. Endoscopic retrograde cholangiopancreatography (ERCP) identified and removed common bile duct stones and 14 days later she underwent laparoscopic cholecystectomy with favorable outcomes.

Case 4: An 84 year old female with operated pertrochanteric hip fracture (DHS – dynamic hip screw) developed aggravating upper abdominal pain 3 days after surgery. Her medical history showed she has had prior gastric resection and Pean anastomosis. Initial diagnosis of cholecystitis and acute abdomen were clarified during celiotomy: perforated acute gastroduodenal anastomosis ulcer and chronic lithiasic cholecystitis. After surgery, the general status quickly worsened and she died 5 days later.

Case 5: A 66 year old male admitted for subtrochanteric fracture was operated 4 days later with closed reduction and

internal fixation. Five days postoperatively, the patient experienced nausea, vomiting, 3 episodes of diarrhea, abdominal pain and leucocytosis. The next day he was transferred to the surgical department where he underwent emergency laparotomy. The intraoperative findings were: toxic megacolon with generalized secondary peritonitis. The postoperative evolution was unfavorable and the patient died 2 days later due to septic shock. (Fig. 4)

Case 6: An 83 year old female with multiple comorbidities was admitted for femoral neck fracture. Four days into the preoperative planning she developed signs of peritonitis and was transferred to the surgical department. Next day surgical exploration identified acute gastric ulceration that was sutured. Postoperatively the evolution was unfavorable and she died 15 days later.

Case 7: A 64 year old male was admitted for elective total hip replacement due to degenerative osteoarthritis. The standard procedure through a lateral approach involved insertion of an uncemented implant (Biomet) (Fig. 5). Four days postoperatively the patient developed nausea, abdominal pain, distention, absence of intestinal transit with multiple hydroaeric levels with both small and large intestine distention and absence of transit (Fig. 6). Emergency surgical exploration found acute colonic pseudo obstruction with massive colonic and small bowel distension and diastatic lesions of the right colon. The patient developed deep venous thrombosis of the right calf and was discharged with favorable outcome.

Case 8: A 78 year old female was admitted for treatment of a femoral neck fracture. The surgery went uneventful (Fig. 7). Four days after the surgery, the patient was transferred to the general surgery department due to symptoms of acute lithiasic cholecystitis. Emergency surgery was performed the next day with cholecystectomy and subhepatic drainage. The patient was later discharged with favorable outcomes.

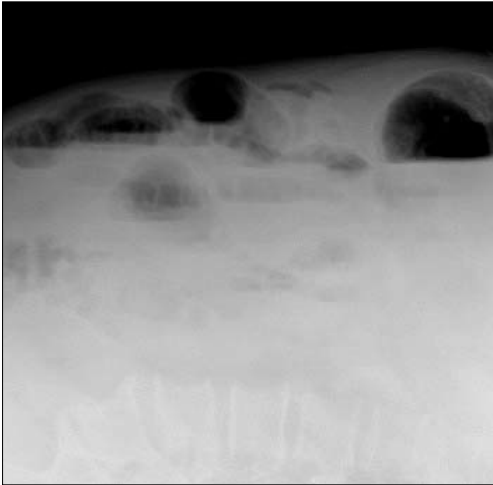


Figure 4. Multiple hydroaeric levels with both small and large intestine distention (Case 5)



Figure 5. Uncemented total hip arthroplasty (Biomet) (Case 7)



Figure 6. Multiple hydroaeric levels with both small and large intestine distention (Case 7)

Discussion

The incidence of perioperative acute abdominal complications is very low in a general orthopedic department (0.00086%). However, all were hip surgery patients, which comprise only 16.17% of the total number of cases. Furthermore, three quarters of acute abdominal complications are linked to proximal femur fractures. Although very rare, it is important to underline that perioperative acute abdominal complications of hip surgery are severe. Five out of the 8 cases died, compared to 2.27% in overall hip surgery incidence.

Perioperative gastrointestinal complications are reported at around 1% in total hip surgery but these include many situations apart from acute abdominal emergencies (4). Most of the abdominal complications from our study are part of the stress response to trauma and surgery.

The aging of population will lead to increase in the number of hip arthroplasties and proximal femoral internal fixations (5). Even though hip surgery is becoming more and more standardized and safer, the increase in hip arthroplasty prevalence will ultimately raise the number of joint revisions, which have more risks and higher complication rates (6).

The recent focus on fast track, early recovery to shorten hospital stay has been advocated to promote rehabilitation and reduce costs. In our clinic, the average length of hospitalization for proximal femoral fractures revolves around 17 days, with just under 4 the preoperative waiting time. This covers most of immediate postoperative complications since the majority will arise in the first 3 to 7 days (7,8).

Virtually all of our patients received neuraxial anesthesia: combined spinal epidural with catheter maintained for 24h (all arthroplasties and some osteosynthesis), spinal or epidural for most pertrochanteric fractures. Lack of routine use of general anesthesia, non-use of self-administered opioid analgesia and overall reduced use of opioids in the postoperative period

Figure 7. Hip hemiarthroplasty for femoral neck fracture with uncemented bipolar implant (Biomet) (Case 8)



decreases the risk for ileus and even other major complications (9).

Judicious use of antibiotic prophylaxis reduces clostridium enterocolitis (10). The standard regimen for all studied patients was 2 days of I-st (cefazolin), II-nd (cefuroxime) or III-rd (ceftriaxone) generation cephalosporines. Case 6 was presumed to be linked to *Clostridium difficile* enterocolitis but we did not find proof of laboratory confirmation. Standard doses of low molecular weight heparin were used for deep vein thrombosis prophylaxis. The 2 cases that required cholecystectomy were performed through laparoscopy, one with preoperative cholangiopancreatography (ERCP) (11). None were acalculous, which would be more related to surgical and traumatic shock (12).

The retrospective identification of cases was limited by correct coding and reporting of patients in the electronic data-

base. In our study population, the majority of postoperative dynamic ileus resolve spontaneously or by conservative means with favorable outcomes. Furthermore, most upper gastrointestinal bleeding episodes were encountered in the absence of stress ulcers and were treated conservatively.

Conclusion

Acute perioperative abdominal complications are rarely encountered during orthopedic surgery. When these do occur, they do so almost exclusively in patients with hip pathology, comorbidities and most often lead to life-threatening situations. We thus emphasize the need for early identification and appropriate management by both orthopedic and general surgery doctors in order to improve patient safety.

Authors contribution

All authors have made substantial contribution to the concept and design, acquisition of data or analysis and interpretation of data, drafted and revised the article and approved the version to be published.

Conflicts of interest and source of funding

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The study was approved by the Research Department and Ethics Committee of the Emergency Clinical County Hospital Timisoara and all measures were taken to ensure patients' safety and privacy.

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