Case Report

Acute Cholangitis following Intraductal Migration of Surgical Clips 10 Years after Laparoscopic Cholecystectomy

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1. Background

Cholecystectomy represents the gold standard for definitive treatment of symptomatic gallstones. Estimated 57,000 cholecystectomies were performed in the UK in 2012 [1] and around 600,000 are performed in the United States annually [2]. Approximately 90% of these are performed laparoscopically in the modern era, and this can involve a 3-port, 4-port, or single-port laparoscopic technique [3]. Irrespective of approach, following dissection of Calot's triangle, the majority of surgeons opt for clipping the cystic duct (CD) before dividing it. Surgical clip migration following cholecystectomy was first described by Walker et al. in 1979 [4], and since then a limited number of case reports have described this rare complication [5, 6]. The precise pathophysiological mechanism responsible for clip migration remains uncertain, though it is understood that the migrated clip(s) can serve as a nidus for stone formation (coining the term “clip cholelithiasis”). Here we describe the case of a patient who presented with acute cholangitis secondary to intraductal migration of surgical clips 10 years after laparoscopic cholecystectomy.

2. Case Presentation

A 55-year-old female was brought in by ambulance to Accident & Emergency with severe abdominal pain, nausea, vomiting, and overwhelming sepsis. The patient was visibly jaundiced at presentation. Physical examination revealed marked tenderness in the right upper quadrant and the patient was found to have a temperature of 38.5°Celsius, with associated tachycardia (HR ~120 bpm) and hypotension (systolic BP ~80 mmHg). The only feature of note in her past medical history was an uncomplicated laparoscopic cholecystectomy some 10 years earlier. Initial laboratory indices were as follows: WBC 14 × 10^9/L, ALT 78 IU/L, ALP 242 IU/L, and total bilirubin 97 umol/L. After fluid resuscitation the patient was commenced on broad spectrum antibiotics and transferred to the high dependency unit (HDU) for vasoressor support. The working diagnosis at this...
3. Discussion

Although rare, clip migration following laparoscopic cholecystectomy has been described in a number of case reports and should be recognised as a potential late complication after surgery. Though first described as a potential post-cholecystectomy complication in 1979 [4], the exact incidence of recurrent stone formation around metallic clips remains unknown. The precise mechanism responsible for clip migration remains unclear, though it has been suggested that compression of the clipped CD stump over time by adjacent structures (in particular the liver) can lead to invagination of the CD and clips into the CBD [7]. It is thought that the inverted CD stump eventually undergoes necrosis, presumably due to local pressure effects that follow inversion, allowing the clips to fall away into the CBD lumen, where they can serve as a focal point for gallstone formation [7]. Operative factors are likely to play an important role and logically a short CD stump with clips applied in close proximity to the CD/CBD junction may result in a greater risk of subsequent clip migration. Furthermore, accurate clip placement during surgery may prevent loosening, dislodgement, and ultimate migration of clips. Some authors have suggested that the use of absorbable suture material in favour of metallic clips may have a role in preventing foreign-body associated stone formation [8]. However cases of stone formation around absorbable material have also been described [9]. It should be noted that biliary clip migration is not restricted to internalisation into the CBD; poor clip application to the CD can lead to clip dislodgment and resultant biliary peritonitis [10]. In addition, a review of the literature reveals that clip migration after cholecystectomy can also lead to other gastrointestinal complications; for example, cases of clip migration into the duodenum have been described which have led to duodenal ulceration [11].

In our opinion, thorough skeletonisation of the CD and distal application of the minimum number of metallic clips/ligatures are measures that are more likely to reduce the likelihood of CD stump invagination and may reduce the risk of inadvertent clip migration. Although this is a rare cause of cholangitis after cholecystectomy of unproven pathogenesis, it should be recognised early with correct imaging and treated with ERCP and stone extraction.

4. Learning Objectives

(1) “Clip cholelithiasis” is a rarely encountered complication following laparoscopic cholecystectomy which can lead to obstructive jaundice.

(2) The precise pathophysiological mechanism by which surgical clips migrate from the original site of application remains uncertain.

(3) The time interval between cholecystectomy and clip migration can vary, and symptoms may not manifest until years after the initial procedure.
Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

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