Are Migrated Clips Reportable?

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Learning objectives

- The purpose of our educational exhibit is to show the importance of identifying the *migrated clips* and carefully evaluating them for their potential harmful complications that might be predictable.
Background

Surgical clips have been used for many years in variety of surgical procedures and they have proven competency and efficacy. The number of the surgical clips used is variable and unpredictable which depends on the procedure.

However, regardless of their type, migration of the surgical clips away from the surgical site is well known phenomenon that occurs quite regularly. Especially with increasing availability and utilization of the CT scan nowadays, we are able identify those **Migrated Clips** quite often. The main question that a reporting radiologist should ask is 'Is that particular migrated clip worth reporting'?

Most of the times migrated clips do not cause any harm to the patient and considered by most surgeon as benign finding. However, there is increasing number of reported cases of the "unusual" harmful complication. Martinez J et al (7), suggested that migrated clips are more often associated with laparoscopic procedures. And of course this imply that we would expect to see more of Migrated clips with the vast preferred use of laparoscopy.
Findings and procedure details

Most reported cases in the literature were migrated clips associated cholecystectomy that migrated up to the biliary system and act as a focus for biliary stone formation or as an obstructing "stone" by itself. Other reported biliary complications is ascending cholangitis. The presumed mode of intra-biliary migration is erosion through the cystic duct stump. (7) (8) (11) (14)

One of our cases the patient came for routine scan and had previous cholecystectomy (Fig. 1, 2). The scan showed a migrated clip up at the right sub-phrenic region. Although the patient is asymptomatic, this clip might cause future serious complications. Saito Y et al. (12) reported a case of recurrent chest empyema that was clinically improved after surgical removal of the migrated clips from cholecystitis. This has occurred probably due to foreign body reaction process. Similar pathology at another location also been reported where two cases showed inflammatory reaction at the pelvis secondary to migrated clip(s). (5)

There are many several known methods of tubal ligation (including: coiling system, silicone matrix system, and tubal clips). According to our practice in our institution, we don't encounter many tubal ligation devices and this is probably cultural. However, we encountered this young lady who presented to the ER with right lower quadrant pain and local tenderness. She gave history of previous old tubal ligation with Filshie® clips many years ago with no pregnancy occurred since then. CT scan of the abdomen was performed to rule out appendicitis and it showed a complex cyst at the right adnexa with migration of the right Filshie® clip away from the right adnexa and uterus (Fig 3). The clip was clearly separated by a bowel loop (Fig 4). Since everything else was normal in the scan, ectopic pregnancy was the main concern. The patient had an ultrasound and pregnancy test; with the latter being negative, hemorrhagic cyst was then the presumed diagnosis. This case demonstrate the diagnostic dilemma that was caused by the odd position of the clip; despite the fact that migration of the ligation clip does not necessarily indicate sterility failure. Although this was not case, Filshie® clips failure can occur in around 0.5% of cases in the first year. (1)

Abdominal wall hernias are an added potential spaces where migrated clips can be found. It also has been reported that one of the detached tubal ligation clip migrated through the anterior abdominal wall and caused a local inflammatory reaction (2). We encountered fairly similar case but with another type of clip and surgery where an open migrated clip located within anterior abdominal wall hernia and surrounded by minimal local inflammatory reaction (Fig 5, 6).
Several cases have been reported in the literature describing the complications of migrated tubal clips including: migration to urinary bladder, ureter, uterus, duodenum, as well as the rectum. (4) (9) (10) (13) (15) (16)

Most of these cases there was evidence of local chronic inflammatory reaction - proved surgically or by endoscopy but not yet radiologically! - That eventually lead to the migration of the clip through the wall of these organs or the surgical stump.

Having said that, we encountered several cases where the migrated clips are located in close proximity to an organ that potentially can be perforated (Fig. 7-15).

But since chronic inflammatory reaction around the migrated clip is the current presumed prerequisite for the clip to perforate or migrate through an adjacent organ, we suggest that any migrated clip should be closely evaluated for such reaction, location, and the persistence at the same location. Depending on our finding, we should act accordingly.

Limitations:

- Most of our patient lack to clinical symptoms that might be caused by the migrated clip location, such as irritation of the liver capsule or the diaphragm.
- Because of the lack of significant findings related to the migrated clips, no follow up scan are available.
Fig. 3: This patient came with periumbilical pain and had previous cholecystectomy. There is a migrated clip (arrowhead) within the periumbilical hernia. The surrounding fat stranding and fluid (star) could related to either strangulated hernia or foreign body reaction to the clip.
Fig. 4: This patient came with periumbilical pain and had previous cholecystectomy. There is an open migrated clip (arrowhead) within the periumbilical hernia.

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Fig. 7: Migrated cholecystectomy clip located just posterior to the left seminal vesicle (arrowhead). No surrounding inflammatory reaction but will this affect the patient in the future?
Fig. 8: Migrated cholecystectomy clip sitting on top of the left liver lobe capsule (arrowhead). The capsule will this cause an irritation to the liver capsule which may lead to feature complain?

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**Fig. 9:** Migrated clip after retroperitoneal lymph node dissection (arrowhead) which is located at the mesorectal fat. although there is no surrounding reaction, it has been reported that clips "can" migrate through rectum.

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Fig. 10: This patient underwent whipple's procedure and there is a migrated clip (arrowhead) attached to the ascending colon (star).

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**Fig. 11:** Open migrated cholecystectomy clip located at the sub-hepatic recess. Again this might be an irritant to the liver capsule.

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**Fig. 1:** Chest radiography showing a metallic clip at the right subphrenic region (arrowhead).

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Fig. 2: The CT scan showing how is this clip is at unusual place just below the right hemidiaphragm (arrowhead) and it has also been reported that migrated clip at this particular location may lead to empyema.
**Fig. 12:** Abdominal radiography showing the cholecystectomy clips (arrow) and the open migrated clip at the right side of the pelvis (arrowhead)

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**Fig. 13:** The CT scan shows the very proximal location of the migrated clip to the right fallopian tube (arrowhead). Does this patient have a risk of migration through the uterus? specially that this has been reported with tubal ligation clips. Free fluid also noted (star).

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**Fig. 14:** Migrated cholecystectomy clip (arrowhead) located adjacent to the right bladder wall. Close observation for any inflammatory reaction is important as these might migrate through the bladder wall.

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**Fig. 15:** similar case showing the location of the migrated clip (arrowhead) just posterior to the urinary bladder. Again this should be evaluated for any surrounding reaction, which was not present in this particular case.

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**Fig. 5:** This CT cut is showing the close relation of the left tubal ligation clip (arrow) to left side of the uterus(U) and the right adnexal complex cyst.
**Fig. 6:** In this cut the right tubal ligation clip (arrow) is clearly separated from the uterus (U) and adnexal region by intervening small bowel loops.
Conclusion

Apart from the tubal ligation clips complications, Most of the complications were reported in non-radiological journals! Migrated clips are quite common and we encounter them almost every day. Although the frequency of complications is rare, we as radiologists should be aware of the potential harms that might occur and we should remind ourselves that migrated clips are indeed themselves "foreign bodies"!
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