CASE REPORT

Unusual cause of renal stone following robotic pyeloplasty

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SUMMARY

Non-absorbable Hem-o-Lok clips are commonly used for vascular pedicle control or suture stabilisation during laparoscopic or robotic reconstructive procedures. As they are placed close to suture line and with tension, these clips have a propensity to migrate. We report a case of a 22-year-old man with history of bilateral robotic pyeloplasty presenting with left inferior calyceal stone. He underwent left mini percutaneous nephrolithotomy which revealed an encrusted migrated Hem-o-Lok clip that was used to close the mesenteric window formed during transmesocolic pyeloplasty. Thus, these clips should be used sparingly and only at places where other effective alternatives are unavailable.

BACKGROUND

In the current era of minimal invasion, laparoscopic and robotic surgeries have taken a forefront and are now considered essential skills rather than a privilege, by the patients and surgeons alike. Intracorporeal suturing and vessel ligation are two main challenges faced by minimally invasive surgeon, at least in the initial phases of his learning curve, and a number of devices and tools are available to ease these steps and shorten the operative time. One such device is the Hem-o-Lok clip (Weck, Teleflex Medical, Research Triangle Park, North Carolina, USA). These clips are primarily used either for vascular pedicle control or for suture stabilisation during reconstructive procedures such as radical prostatectomy, partial nephrectomy and occasionally in pyeloplasty and pyelolithotomy. These radiolucent clips are non-absorbable, thus are permanent and the literature reports several cases where these Hem-o-Lok clips have migrated into bladder, urethra, ureter, renal pelvis and even gastrointestinal organs such as rectum, duodenum and common bile duct. The tension in the suture line which is stabilised with the clip and the clips proximity to the suture line predispose to such a migration. We report a case of intrarenal migration of non-absorbable Hem-o-Lok clip after left robotic pyeloplasty. The pyeloplasty was performed transperitoneal transmesocolic route in the standard dismembered fashion with 3–0 Vicryl, knotted normally at both the ends. The mesocolic window was approximated using 3–4 large Hem-o-Lok clips, and 1 of these clips migrated to inferior calyx of left kidney, presenting as a renal stone, 6 years after pyeloplasty.

CASE PRESENTATION

A 22-year-old man presented to our outpatient department with left flank pain of 6 months

duration, which was mild and non-colicky in nature, occasionally requiring oral analgesics. He previously underwent bilateral robotic Anderson Hynes dismembered pyeloplasty about 6 years back at our institute, with a 3–0 Vicryl continuous suture using transmesocolic approach on the left side. Bilateral double J (DJ) stents were removed at 6 weeks post-surgery. He was asymptomatic and follow-up scans showed bilateral non-obstructive drainage with a stable function and thus was discharged from our outpatient care 3 years postsurgery.

INVESTIGATIONS

For this recent onset left flank pain he was evaluated with a X-ray of the KUB (kidney and urinary bladder) region and ultrasonography, which revealed a 1 cm stone in lower polar region of left kidney with mild residual dilation of the left pelvicalyceal system ([figure 1A](#)). His renal dynamic scan showed left side 43% function and bilateral non-obstructive clearance. A non-contrast CT of KUB region revealed a small calcified foreign body in the inferior pole of left kidney, likely residual fragment of a DJ stent ([figure 1B, C](#)).

TREATMENT

He underwent left side mini percutaneous nephrolithotomy (PCNL) via infracostal inferior calyceal puncture and a 16Fr sheath with a 12Fr nephroscope was used. Holmium-YAG laser was used to fragment the encrustations, revealing a large sized Hem-o-Lok clip which was retrieved using forceps ([figure 2A, B](#)). Complete clearance was documented fluoroscopically and a DJ stent and a 14Fr nephrostomy were placed.

OUTCOME AND FOLLOW-UP

He had uneventful recovery and was discharged on postoperative day 2.

DISCUSSION

Any kind of non-absorbable foreign material left inside the body, intentionally or unintentionally, whether be it a cotton gauze, embolisation coils, metal clips or Hem-o-Lok clips always have potential for risks and complications, the most common being migration. Specific to urological surgery, migration of Hem-o-Lok clips are most commonly reported after minimally invasive radical prostatectomy both after laparoscopic and robotic approach.¹ Here, the clips that are placed in close vicinity of vesicourethral anastomosis, either to stabilise the running anastomotic suture or to control the lateral pedicles, erode into bladder or urethra

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Figure 1 (A) Plain X-ray of KUB region showing 1 cm radio-opacity in left renal area. (B and C) Axial and coronal sections of non-contrast CT scan of KUB region showing 1 cm stone in left lower calyx.

Figure 2 (A and B) Intraoperative images of percutaneous nephrolithotomy showing laser lithotripsy of encrusted Hem-o-Lok clip. (C) The usual way we used to close mesocolic window made for transmesocolic pyeloplasty. Inset: the removed Hem-o-Lok clip and its encrustations.

with subsequent encrustation.^{1 2} Another commonly reported procedure with the possibility of clip migration is partial nephrectomy. The sliding renorrhaphy technique places multiple non-absorbable clips near the closed parenchymal defect, theoretically risking subsequent migration into the pelvicalyceal system, especially if it was opened during excision of the mass. These clips may obstruct the pelviureteric junction or the ureter.^{3 4} The proposed mechanism predisposing to migration is proximity to the suture line and the clip which is used to stabilise the anastomotic suture probably has the highest chance.⁵ Here, we report a case of migration of a Hem-o-Lok clip placed to close the mesenteric window made during transperitoneal transmesocolic robotic pyeloplasty, which is a commonly described technique (figure 2C). Another commonly used technique is to use either Vicryl or V-locc absorbable suture.⁶ The pelviureteric anastomosis was performed by the dismembered technique with a 3–0 Vicryl continuous suture that was knotted normally at both the ends. To the best of our knowledge, this is the first report of intrarenal migration of a clip that was used away from the primary suture line with intent to close the mesocolic defect and create a barrier between retroperitoneal and intraperitoneal space.

Besides the symptomatic presentation and the need of secondary intervention, these migrated clips may affect the integrity of the anastomosis and worsen the surgical outcomes. Postrobotic prostatectomy, the physical disruption of the anastomosis by the migrated surgical clip may lead to prolonged urinary leakage and subsequent bladder neck contracture.³ Migration of clips have not been reported after pyeloplasty, likely due to preference for standard suturing rather than clipping. Renal pelvic migration of a clip used to stabilise the anastomotic 4–0 Vicryl suture 2 years after laparoscopic pyelolithotomy has been previously seen.⁵ However, there was possibly no untoward effect on

the anastomosis of this migration and the patient was managed ureteroscopically. In the current case, despite the anastomotic disruption by clip migration, no untoward effect was noted on the success of pyeloplasty and the clip migration to inferior calyceal location and the pelvicalyceal anatomy favoured mini-PCNL. To conclude, although quick and easy, non-absorbable clips may erode into the collecting system even if the site of placement is far from the suture line and should be used as sparingly as possible. We have modified our technique and use absorbable sutures to close the mesenteric window after transmesocolic approach.

Learning points

- ▶ Non-absorbable Hem-o-Lok clips are primarily used for vascular pedicle control and suture stabilisation in minimally invasive surgery.
- ▶ These clips have a potential to migrate years after primary surgery.
- ▶ Such migration can occur even if these are used away from the primary suture line.
- ▶ In this case, clips used to close mesenteric window migrated into renal pelvis.
- ▶ Thus, these clips should be used as sparingly as possible.

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