

Texas Pain Society 3rd Annual Scientific Meeting

TITLE: Intrathecal Pump Hygroma: A Case Report

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INTRODUCTION:

Implantable intrathecal infusion pumps are becoming more popular in the treatment of chronic pain. One of the complications of this device is a cerebrospinal fluid (CSF) leak, also known as a hygroma. These hygromas can occur in up to 20% of patients with an intrathecal device; however, they typically occur after implantation of the device and resolve spontaneously in 1-2 weeks.

This clinical case discusses the discovery and management of a pump hygroma when it occurs beyond the time of implantation and when it does not spontaneously resolve.

CLINICAL CASE:

A 50-year-old female patient had an intrathecal infusion pump containing dilaudid and bupivacaine implanted in 1996 for the treatment of her chronic pain syndrome and left lower extremity complex regional pain syndrome (CRPS) type I. Subsequently, she had the pump replaced in 2000 and in 2007 to update her pump battery. Since having the pump, she had experienced moderate pain relief and significant improvement in her quality of life. She was compliant with follow-up and returned to clinic every 2-3 months for her pump refill. During one of her pump refill appointments she was noted to have a 50% increase in her pain numerical rating scale and a fluid collection was noted over her pump. The patient denied any symptoms related to infection, postdural puncture headache, or withdrawal. A total of 75ml of clear fluid was aspirated from over the pump site, which was positive for trace protein on dipstick analysis. The aspirated fluid was sent to the lab for beta-2 transferrin testing to test for the presence of CSF, which was later resulted as positive. Because of these findings, the patient was scheduled for a pumpogram and possible intrathecal pump revision.

Unfortunately, the procedure was delayed due to abnormal coagulation studies and the patient's schedule; thus, she followed up in clinic for two subsequent visits. Each visit was 2 months after the previous and revealed a return of the hygroma. An aspirate of 72ml and 80ml, respectively, was obtained, and the patient continued to deny symptoms of headache, infection, withdrawal, or sedation.

Almost 5 months after the discovery of her hygroma, the patient's pumpogram took place in the operating room, which revealed a collection of contrast accumulating behind the pump and none ascending up the catheter (Figure 1). Because of the pumpogram findings, the procedure evolved into an intrathecal pump exploration and revision.

The pump was excised from the abdominal pocket, and the section of the catheter proximal to the catheter port was found to have several erosions in the areas where the catheter was in close proximity to the pump (Figures 2 & 3). After excising the defective portion, which measured 10.5cm, the free edges of the catheter were spliced together and reattached to the pump's catheter port. The pump was re-programmed from her rate of dilaudid 16mg/day and bupivacaine 3.4mg/day to the lowest allowable rate of dilaudid 0.2mg/day and bupivacaine 0.4mg/day in order to determine what her actual drug requirement would be since the defective catheter was not delivering drug to the intrathecal space.

She was admitted to the hospital and started on a dilaudid PCA and monitored for signs of narcotic withdrawal. After 3 days, the patient had an uneventful hospital course and was discharged home with her pump programmed at a rate of dilaudid 0.3mg/day and prn Norco for withdrawal symptoms.

On post-operative day 15, the patient was taken back to the operating room for pump exploration due to clear fluid extravasating from her incision site. Upon exploration, it was noted that the splice site had been under tension by the shorter catheter segment and from the increased mobility of the pump, which caused the splice site to disconnect. The splice site was revised by attaching a longer catheter extension to this segment and re-splicing the catheter.

Since these events, the patient has returned to clinic for two follow-up appointments. She is without hygroma, and her pump rate is being titrated up as tolerated with each visit.

CONCLUSION:

This case illustrates how an intrathecal pump hygroma can occur at anytime after implantation of the device. The differential diagnosis of a pump hygroma include: disconnection of catheter from intrathecal pump, catheter fracture, and CSF leak around the dural puncture site.

In order to rule out each of the differentials (Table 1), aspirate the fluid around the pump and send to the lab for CSF detection. Next, perform a pumpogram. If the pumpogram is normal, consider an epidural/subdural blood patch or consider surgical revision and/or exploration at the dural puncture site. If the pumpogram is abnormal and a catheter fracture is identified, replace the catheter. If the catheter is disconnected, reattach the catheter.

The key elements in the discovery and management of this complication are routine evaluations, a thorough history and physical examination, as well as appropriate laboratory studies, diagnostic imaging, and being able to rule out the differential diagnoses if a hygroma is suspected.

REFERENCES:

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Deer, T. Intrathecal Drug Delivery for Pain and Spasticity. Volume 2

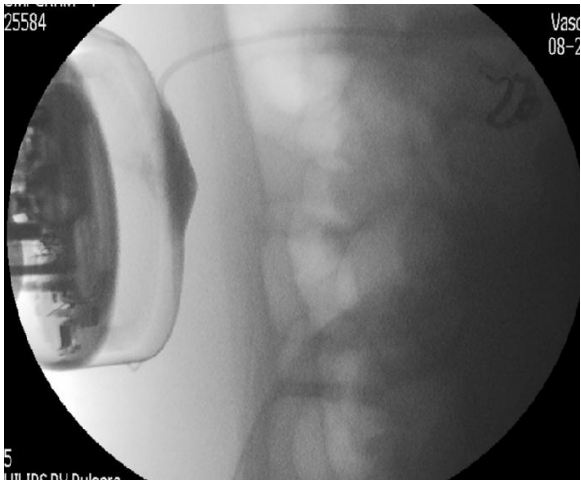


FIGURE 1

Pumpogram with contrast accumulating behind the intrathecal pump

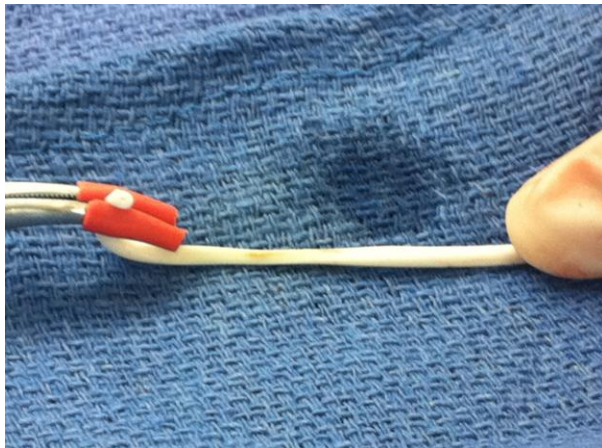


FIGURE 2

Excised intrathecal pump catheter defect

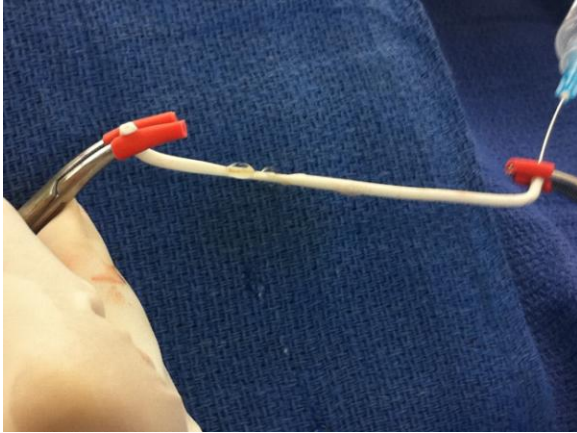


FIGURE 3
Excised intrathecal pump catheter defect

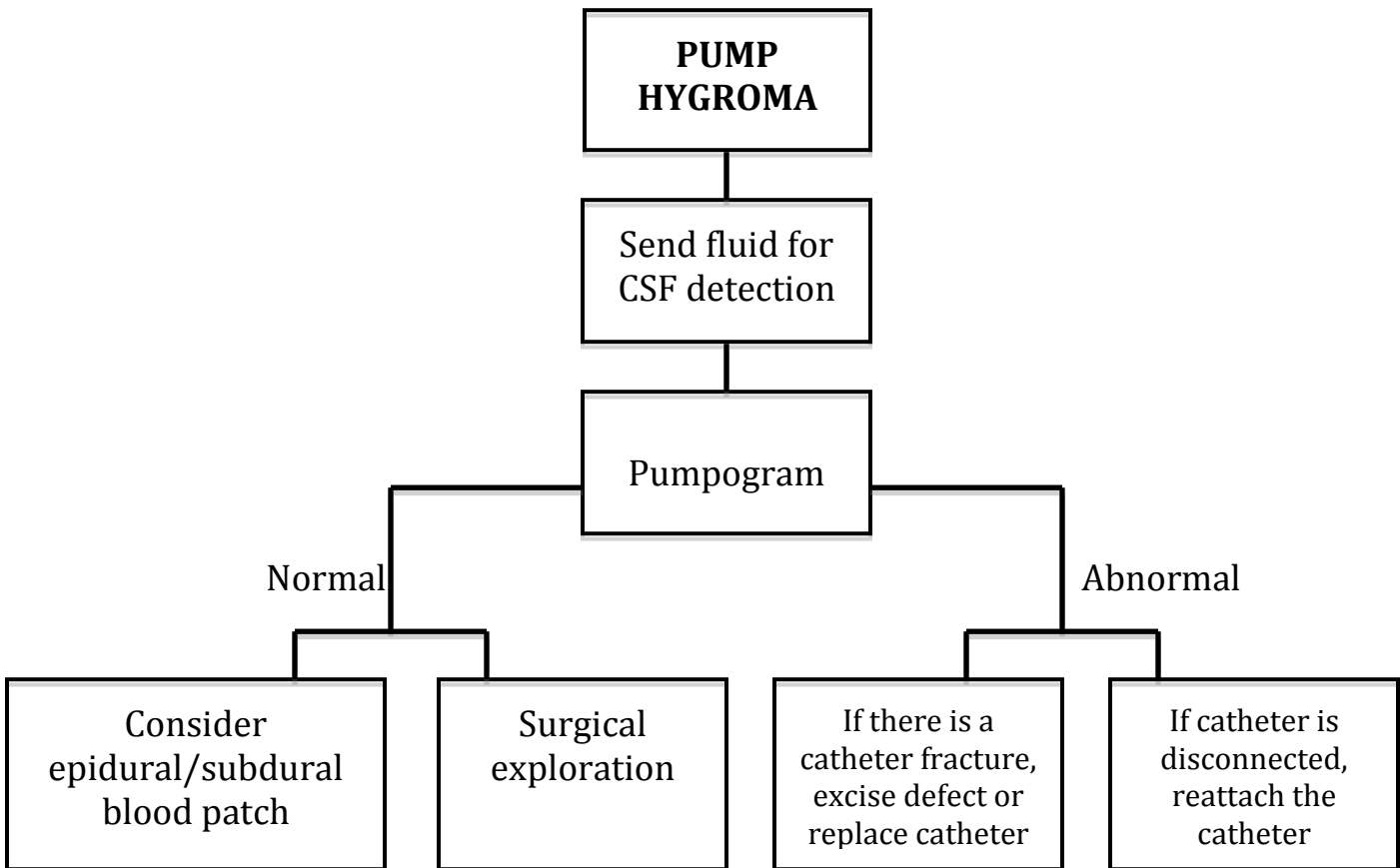


TABLE 1
Pump Hygroma Management Algorithm