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CASE REPORT
Breast

A Subglandular Breast Cerebrospinal Fluid Pseudocyst Following Postsurgical Shunt Migration

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Summary: Cerebrospinal fluid (CSF) drainage catheters have been associated with numerous complications in various anatomic locations, because of migration, infection, and obstruction. However, breast-related CSF shunt complications tend to occur infrequently or have seldom been reported in the empirical literature. Therefore, a case is presented detailing a breast pseudocyst caused by migration and subsequent coiling of a ventriculoperitoneal shunt in the right breast pocket. To the best of the authors' knowledge, this is the first case that has been reported in the peer-reviewed literature of a pseudocyst resulting from a CSF drainage catheter coiling around the breast implant post pancreaticoduodenectomy. Moreover, this case highlights the importance of cross-disciplinary procedural awareness, particularly in regards to breast, ventriculoperitoneal shunt, and pancreatic procedures. *(Plast Reconstr Surg Glob Open 2015;3:e579; doi: 10.1097/GOX.0000000000000561; Published online 15 December 2015.)*

Ventriculoperitoneal (VP) shunts are a relatively common treatment modality for hydrocephalus, with a common set of complications that are routinely corrected. The shunt tubing is almost always located in the superficial adipose space and has a medial or lateral trajectory avoiding breast tissue and/or implants.[1] Additionally, in the case of submuscular breast prostheses, the pectoralis muscle acts as a barrier circumventing direct communication between shunt and implant.[1] However, when tunneling and implants are not placed in the optimal location and the abdominal contents in proximity to the distal end of the VP shunt are disturbed, rare complications have an increased propensity to occur. Although other cases of breast-related cerebrospinal fluid (CSF) shunt complications have been reported,[1–19] this is the first reported case with this sequence of events and distinct etiology.

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CASE REPORT

The case involves a 62-year-old white woman with a past medical history of diffuse subarachnoid hemorrhage with hydrocephalus in 2013, requiring placement of a VP shunt. Postoperatively, there was no shunt failure or dysfunction present, and both shunt and abdominal incisions healed uneventfully. Notably, before 18 years, the patient underwent elective breast augmentation surgery with saline implants. In 2014, approximately a year after the VP shunt placement, the patient was diagnosed with pancreatic adenocarcinoma that required a Whipple procedure later that year. She subsequently presented to the plastic surgery clinic at our institution complaining of painful, rapid enlargement of her right breast (Fig. 1). The patient was sent to our clinic to rule out infection, recurrent tumor, and possible CSF leakage. On examination, the patient denied headache, visual changes, fever, chills, chest pain, shortness of breath, nausea, and

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Fig.1. Photograph showing right-side breast swelling because of VP shunt coiling resulting in CSF accumulation in the right breast pocket.

vomiting. Removal of the right breast implant was recommended.

Preoperative clearance and evaluation were obtained. The procedure was performed with the patient under general anesthesia. Preoperatively, the area of CSF shunt displacement, which was located on the lateral border of the right peristernal area, was outlined with methylene blue. Intraoperatively, the pocket of the right breast was identified, a syringe was placed inside the pocket, and approximately 100 mL of a clear aspirate was collected (Figs. 2, 3). The fluid was subsequently sent for cytology and returned positive for CSF. In addition, a small area of the sub–pectoralis major capsule was removed and sent for pathology. The results were consistent with chronic inflammation. The patient tolerated the procedure well and was scheduled for shunt removal at an outside hospital.

DISCUSSION

VP shunts are one of the most common procedures performed by neurosurgeons globally.[1,5] VP shunt complications do occur and have been described in various anatomic locations including the neck,[20] gallbladder,[14] heart,[21] lungs,[22] breasts,[1–19] vagina,[23] scrotum,[24,25] umbilicus,[26] intestinal wall, and anus.[13] Furthermore, rapid changes in breast size, shape, and texture are always worrisome and can have a variety of origins. In the case of pseudocysts, ultrasound guided percutaneous aspiration can be utilized to rule out infection or seroma. However, if the patient's history is positive for VP shunt placement, migration and displacement should always be considered.

In this case, we postulate that the migration of the CSF catheter, resulting in the formation of the breast pseudocyst, was related to the preceding pancreaticoduodenectomy, given the almost immediate right-side unilateral breast enlargement. The exact mechanism

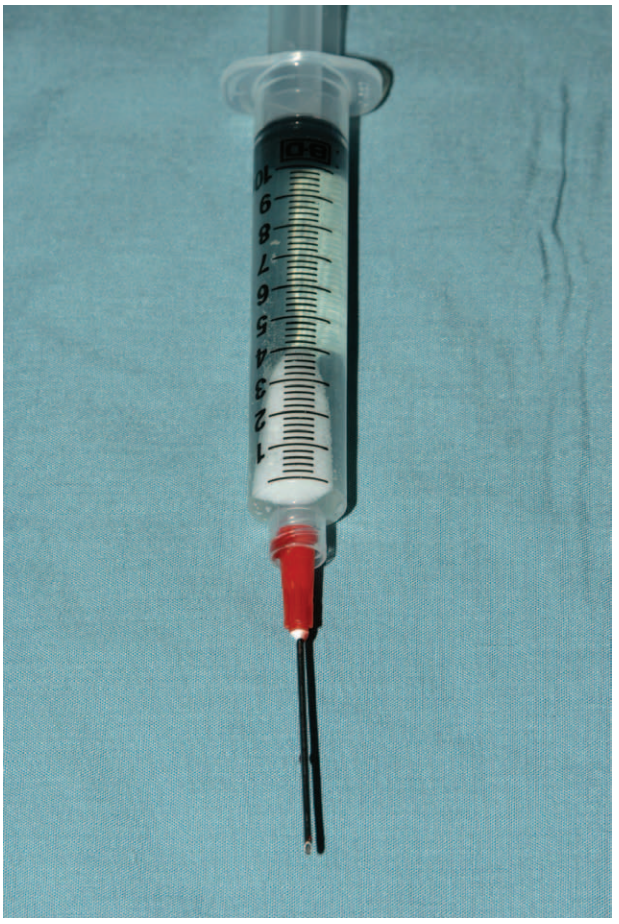

Fig. 2. A syringe showing clear fluid consistent with CSF, aspirated directly from the right breast pocket intraoperatively.

of shunt migration in this case and in most cases described in the literature, however, remains unknown. Nevertheless, possible causes include vigorous implant manipulation,[13] abdominal wall contractions,[4] increased intra-abdominal pressure,[9] forceful rotation or flexion–extension movements,[3] retained memory of the shunt,[27] and most likely in this case disruption of the abdominal contents.[28] Interestingly, many of the reported cases of shunt migration occur in young children because of their rapid growth[29]; yet outside of this subset, migration to the breast pocket is quite rare.

Moreover, with procedures carried out in anatomic proximity to VP shunts, it is crucial to carefully consider all previous surgeries and keep in mind all indwelling medical devices, prostheses, and any atypical hardware. For further complication prevention, surgeons performing the Whipple procedure should be aware of potential difficulties associated with performing this procedure in patients with a history of CSF shunt placement and previous breast augmentation. Careful past medical and surgical history should be obtained and considered when planning optimal surgical outcomes.

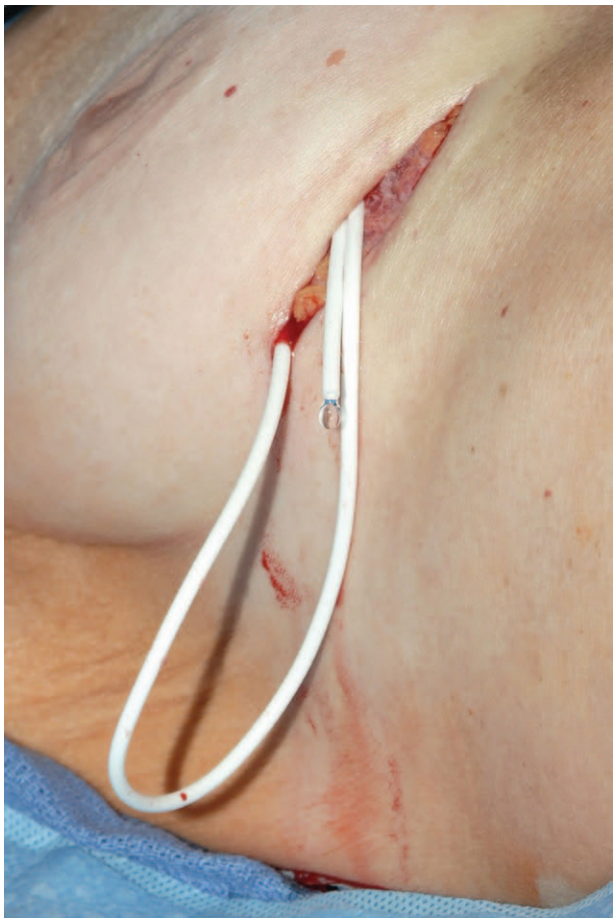

Fig. 3. A coiled VP catheter present after right saline implant removal. A colorless fluid consistent with CSF is visible at the tip.

CONCLUSIONS

This case highlights the importance of cross-disciplinary procedural awareness, particularly in regards to breast, VP shunt, and pancreatic procedures. Additionally, plastic surgeons should be aware of the optimal implantation site in patients with pre-existing VP shunts and should be mindful of the possibility of shunt migration when presented with unilateral breast enlargement in patients with a history of VP shunt placement.

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