Case Report

Right upper quadrant abdominal pain due to malposition of the tip of the distal catheter of ventriculoperitoneal shunt

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\section*{ABSTRACT}

There are few reports about abdominal pain due to shunt malposition which have been located in right lower quadrant. In this case, we reported a 17-years old boy with history of medulloblastoma surgery and shunt insertion who had severe abdominal pain especially in right upper quadrant without any history of fever, nausea and vomiting and any symptoms of ICP rising. Physical examination revealed a moderate tenderness on the right upper quadrant, but rebound tenderness was absent. Laboratory data including CSF analysis were normal. Plain abdominal films showed the tip of the catheter in the right upper quadrant. Abdominal ultrasound showed a very mild collection at entrance site of shunt in peritoneal cavity. After exploration, there was not any surgical finding. The only thing that could explain the abdominal pain, was location of the tip of distal catheter toward the liver around the falciform ligament. The distal catheter was exited and repositioning performed. After surgery, the abdominal pain of the patients was relieved dramatically. After one year follow up, the patient has not any problem with his shunt.

\section{1. Introduction}

Ventriculoperitoneal shunting is mainstay treatment of non- obstructive hydrocephalus which deviates nature pathway of CSF and drains into abdominal cavity. The tip of distal catheter is usually placed in right lower quadrant. There are very rare reports of abdominal and pelvic pain directly induced by a VP shunt. We assume this is under-reported presumably due to the fact that neurosurgeons tend to dismiss or belittle these circumstances facing the morbidity associated with a shunt revision. We observed another case of abdominal pain explained by the tip of the shunt and its location. Our case justifies more proactive revision in these circumstances and not leave the patient alone with this discomfort.

\section{2. Case report}

A 17-years old boy with history of medulloblastoma surgery and shunt insertion in another center, when he was 11 years old, admitted to our emergency surgical department with severe abdominal pain especially in right upper quadrant. After surgery, he had received craniospinal radiation plus chemotherapy and the tumor had been in remission during these years. Last year, because of shunt malfunction, he admitted in that center and the shunt was revised. In this admission in our center, he had no history of fever, nausea and vomiting and any symptoms of ICP rising. His temperature at the time of admission to the hospital was normal. Physical examination revealed a moderate tenderness on the right upper quadrant, but rebound tenderness was absent. White blood cell count was 6500 with 65% neutrophils and 34% lymphocytes. ESR and CRP was normal. Brain CT did not reveal any evidence of hydrocephaly and brain MRI did not show any enhancement in posterior fossa that imply recurrence (Figures not shown). Plain abdominal films and abdominal CT showed clearly the trajectory of the VP shunt into the peritoneal cavity and the tip of the catheter in the right upper quadrant (Figs. 1 and 2). Abdominal ultrasound showed negligible fluid at entrance site of shunt in peritoneal cavity. CSF analysis revealed no WBC and normal glucose and protein. CSF culture was negative. With respect to mild collection and mild tenderness along the distal shunt, with doubts to infection, we explore the distal shunt in abdominal cavity. There was not any pus in peritoneal cavity. We requested a general surgeon to get on the patient's bedside and explore the peritoneal cavity and the tip of the catheter in the right upper quadrant. Abdominal ultrasound showed negligible fluid at entrance site of shunt in peritoneal cavity. CSF analysis revealed no WBC and normal glucose and protein. CSF culture was negative. With respect to mild collection and mild tenderness along the distal shunt, with doubts to infection, we explore the distal shunt in abdominal cavity. There was not any pus in peritoneal cavity. We requested a general surgeon to get on the patient's bedside and explore the peritoneal cavity and the tip of the catheter in the right upper quadrant.
as well as adhesions bands. The only thing that could explain the abdominal pain, was location of the tip of distal catheter toward the liver around the falciform ligament. The distal catheter was exited and repositioning performed. After surgery, the abdominal pain of the patient was relieved dramatically. After one year follow up, the patient has not any problem with his shunt.

3. Discussion

The tip of the catheter frequently ends up in the right lower quadrant, but it could end up anywhere in the peritoneum since it is usually placed blindly. Primary infection of the shunt can sometimes simulate the manifestations of the acute appendicitis. Ascending meningitis with mental status alterations alongside is the most dangerous event in these conditions. There is very rare report of abdominal pain without evidence of infection or visceral injury, due to displacement of distal tip of catheter. Chen and Spetzler have reported 65 years women with persistent lower abdominal pain induced by long peritoneal shunt catheter [1]. In that study, the tip of catheter was ended up in pelvic of the patient. In another case, Charalampoudis has reported right lower quadrant abdominal pain in a patient with prior ventriculo-peritoneal shunting [2] and in the last reported case until now, ventriculo-peritoneal shunt tip was described as cause for recurrent pain episodes in a child [3]. Abdominal discomfort and effusions are also described in peritoneal shunting associated with brain tumors, mainly malignant. The pathology is believed to be protein or peptide irritation from the contaminated CSF and this can be associated with shunt associated ascites and failure to absorb [4]. Although in this case, the CT scan of the abdomen does not indicate this, first of all it should be considered and ruled out in patients with shunt due to brain tumors who are presented by abdominal pain. This is the first report of right upper quadrant abdominal pain due to malposition of tip of catheter in approximately liver falciform ligament. Abdominal pain in a patient with previous history of shunt insertion could puzzle the surgeon about the pathology of pain. This kind of symptom could mimic acute appendicitis especially if it was located in right lower abdomen or could simulate peritonitis and shunt infection. With these reports, it seems that malposition of distal tip of catheter could be considered a rare cause of abdominal pain in a patient with history of shunting. Although this diagnosis, it should be placed in the last rank of differential diagnosis.

4. Conclusion

Ventriculoperitoneal shunting is a common procedure in neurosurgery. This procedure could have many complications like infection or malfunction. Besides, malposition of catheter tip in abdomen could mimic some signs of these complications although it is rare. In accordance to few reports, we should consider malpositioning of catheter tip when we have not any rationale for abdominal pain after shunting.

References