

Endoscopic Evacuation of Post Burr Hole Subdural Empyema Caused by Propionibacterium Acne, Case Report

Mikael Aseged ^{1,2*}, Fuminari Komatsu ², Yoko Kato ²

¹Department of Neurosurgery, Debre Behan University, Debre Berhan, Ethiopia

²Department of Neurosurgery, Fujita Health University, Bantane Hospital, Nagoya, Japan

***Corresponding Author:** Mikael Aseged, Assistant professor of Neurosurgery, cerebrovascular fellow at Fujita Health University Present address- Debre Berhan University, Ethiopia.

Received Date: August 01, 2024; **Accepted Date:** August 12, 2024; **Published Date:** August 19, 2024

Citation: Mikael Aseged, Fuminari Komatsu, Yoko Kato, (2024), Endoscopic Evacuation of Post Burr Hole Subdural Empyema Caused by Propionibacterium Acne, Case Report. *J. Surgical Case Reports and Images* 7(7); DOI: [10.31579/2690-1897/208](https://doi.org/10.31579/2690-1897/208)

Copyright: © 2024, Mikael Aseged. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Introduction: Post burr hole subdural empyema caused by Propionibacterium acnes is very uncommon and drainage with endoscopy is effective and efficient. Less complication than craniotomy/craniectomy and better evacuation the burr hole alone.

case presentation: we presented a 71-year-old male patient who presented to our hospital after he had undergone 2 times burr hole in same site for CSDH in another hospital, with headache. MRI showed restriction on diffuse weighted image and CRP of 19mg/dl. We evacuated the empyema with endoscopy with culture result of P.acnes. He was put on IV antibiotics and had significant improvement.

Conclusion: Endoscopy assisted burr hole evacuation of subdural empyema is a great option to manage this devastating subdural space collection.

Keywords: subdural empyema; endoscopic assisted; p.acnes; post burr hole; chronic subdural hematoma

Abbreviation

CRP- C-reactive protein

CSDH - Chronic subdural hematoma

CT – computerized tomography

DWI-ADC- Diffusion weighted image-apparent diffusion coefficient

MRI- Magnetic resonant imaging

SDE- Subdural Empyema

Introduction

Subdural empyema (SDE), a purulent loculated collection under the dura mater, is a rare condition with the estimated incidence of 0.1 per 100,000 persons. [1]. Because the subdural space lacks any anatomical barrier that could prevent the pus from spreading across the brain hemisphere, it has a rapid course and usually a poor prognosis if not diagnosed and managed early. [2]. It is usually treated with burr hole drainage or craniotomy. With the wide acceptance of neuroendoscopic surgery, it can be used to drain subdural empyema which will help to see the blind spot that cannot be

addressed with burr hole and minimize morbidities associated with Craniotomy. Here we present a case of SDE post burr hole for Chronic subdural hematoma (CSDH) caused by Propionibacterium acne (P.acnes) which is an anaerobic, lipophilic, gram-positive bacteria managed with endoscopic subdural empyema drainage and irrigation then he received intravenous antibiotics based on culture and drug susceptibility. He had improvement.

Case Presentation

A 71-year-old man presented with a headache and a CT scan examination revealed a right side hemispheric chronic subdural hematoma. He underwent burr-hole surgery, hematoma was evacuated and was discharged with improvement. However, a month later, he experienced retro-orbital pain and headaches, followed by weakness in the left upper and lower extremities. The patient was taken to Operation theatre and through previous burr-hole irrigation was done and had improvement. But 1 months after the second surgery the patient complain headache and investigated with MRI and CT as shown below in Fig 1. An MRI examination revealed extra axial fluid collection at previous burr hole side

with heterogeneous intensity on T1 and hyper-intensity on T2, with central foci of hypo-intensity and restricted diffusion on DWI-ADC mapping as shown in Fig 1. The CRP was determined and found out to be 19mg/dl. Using previous burr hole defects endoscopy was advanced to the subdural space since it would be difficult to evacuate the empyema with burr hole alone. The intraoperative findings were a thick abscess in

the subdural space with septation and thin abscess filling the bone defect, with endoscopic-assisted abscess drainage and irrigation it was possible to remove the thick abscess from deep pockets, as shown in fig 2 which was sent for microbiological culture study, identifying *Propionibacterium acnes* as the causative organism. Subdural drain was left, and he was put on IV antibiotics subsequently discharged with significant improvement.

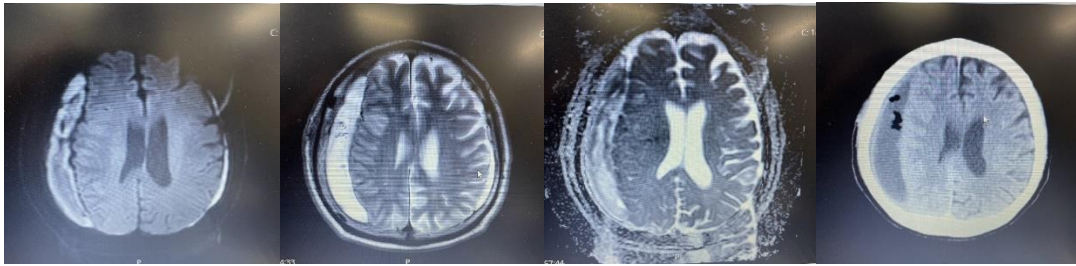


Figure 1: a shows T2 hyper intensity with foci of hypo intensity 1.b and 1.c shows DWI-ADC mapping with restriction and 1.d shows CT of Subdural empyema with central hypo density



Figure 2: shows epidural collection at previous burr hole site, and shows endoscopic view of thick abscess with septation

Discussion

Subdural empyema (SDE) following chronic subdural hematoma (CSDH) surgery is an uncommon but serious complication. Even though it is a rare pyogenic infection it is fatal complication of surgical procedures.^[3] Post operative subdural empyema following burr hole drainage is not commonly reported case. Usually, the implicated organisms are normal skin flora like *Streptococci* sp., *S.aureus*, *S.epidermidis* but the ubiquitous member of skin flora *P.acnes* is a rare cause of intracranial infections.^[4] SDE has nonspecific clinical features, including headache and vomiting which makes it difficult for early diagnosis. Additionally, it is also difficult to differentiate between recurrent CSDH and SDE without special imaging evaluation such as magnetic resonance imaging (MRI) which might suggest more about the content of the subdural collection.^[2] *P.acnes* is an unusual, rare cause of intracranial infection. Although recently some publication reports the increased incidence of *P.acnes* in intracranial pyogenic collections. The incriminated risk factor is brain surgical implant with mild clinical course.^[5] Cultures positive for *P. acnes* may sometimes represent a false-positive result due to contamination which makes the diagnosis of a true infection often challenging. Moreover, these organisms may be difficult to identify initially because of their slow growth. When cultured, they often need more than three days to grow.^[6] In our case apart from the MRI result of restricted diffusion the C-reactive Protein (CRP) value was 19mg/dl which suggest inflammatory and infectious process. Surgical management is necessary for subdural empyema but there are still controversies and depends on surgeons' preference, patient condition and imaging parameters to decide on the mode of management either to use burr hole or craniotomy. Each of them has their own Pros and cons.^[7] Burr hole drainage requires local

anaesthesia, but it poses some difficulties to access and drain septated and thick empyema while craniotomy/craniectomy needs general anaesthesia it gives best view to address thick and septated abscess with the drawback and complication of general anaesthesia and bone flap infection. Endoscopic surgery combines the benefits of both burr hole and Craniotomy with the mere complication of local anaesthesia and requirement of expertise. It gives best view of septated and loculated abscess drainage with burr hole. Jonathan Yun et al also describe superiority of Endoscopic assisted burr hole evacuation of empyema to burr hole drainage alone with regard to recurrence rate.^[8] In our case the use of endoscopy was not only to visualise, but also surgical removal of abscess pockets and cavity was done with endoscopy which has shifted the mode of approach from craniotomy to burr hole since with thick abscess it would have been difficult to see and manipulate with burr hole alone.

Conclusion

Endoscopic assisted burr hole drainage of SDE is effective and can be used to drain even loculated abscesses with local anaesthesia. It will prevent the complications associated with craniotomy/craniectomy like general anaesthesia, bone flap infection and second surgery to replace bone as well as with burr hole alone which is mainly recurrence due to inadequate drainage.

Ethical Declaration- N/A

Patient consent- patient consent was obtained

Author Contribution

MA conceptualization, writing, editing

Y.K- editing

F.K- editing

Funding: No funding was available

Conflict of Interest: Nothing to declare

Acknowledgment: I would like to thank all the neurosurgical staff and patient.

Reference

1. Bridwell RE, Larson NP, Yoo MJ, Oliver JJ. (2020). Subdural empyema in an immunocompetent active duty soldier: A case report. *Mil Med.* 185(7–8):e1326–1328.
2. Kim Y-S, Joo S-P, Song D-J, Kim S-H, Kim T-S. (2018). Delayed intracranial subdural empyema following burr hole drainage: Case series and literature review. *Medicine (Baltimore).*;97(18):e0664.
3. Yamamoto S, Asahi T, Akioka N, Kashiwazaki D, Kuwayama N. et al. (2015). Chronic subdural hematoma infected by propionibacterium acnes: a case report. *Case Rep Neurol.*7(1):6–14.
4. Critchley G, Strachan R. (1996). Postoperative subdural empyema caused by Propionibacterium acnes--a report of two cases. *Br J Neurosurg.* 10(3):321–323.
5. Borni M, Abdelmouleh S, Mechergui H, Elouni E, Boudawara MZ. (2022). A postoperative brain abscess due to Propionibacterium acnes in an immunocompetent adult with incidental discovery. *Annals of Medicine & Surgery.*81.
6. El Soufi H, El Soufi Y, Bagheri F. (2021). Propionibacterium acnes Infection after Craniotomy in a Young Adult with Subdural Hematoma. *Case Rep Infect Dis.*6695286.
7. Kaminogo M, Kurihara M, Kawano T, Mori K, Yasuda M. A case of infected subdural hematoma (subdural empyema) secondary to septicaemia caused by agranulocytosis. *No Shinkei Geka.* 1984 Mar;12(3 Suppl):353-7. Japanese. PMID: 6146937. Case of Infected Subdural Hematoma.
8. Yun J, McDowell MM, Gardner PA, Zenonos GA. (2020). Endoscopic evacuation of a panhemispheric subdural empyema. *World Neurosurg.*144:106–111.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here:

Submit Manuscript

DOI:10.31579/2690-1897/208

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more <https://auctoresonline.org/journals/journal-of-surgical-case-reports-and-images>