



CIRUGÍA y CIRUJANOS

Órgano de difusión científica de la Academia Mexicana de Cirugía
Fundada en 1933

www.amc.org.mx www.elsevier.es/circir



CLINICAL CASE

Acetazolamide in the resolution of cerebrospinal fluid cutaneous fistula after peridural analgesia: Case report[☆]



Félix Manuel Juárez-Adame^a, Yolanda Ruiz-Rubio^a y Ana Bertha Zavalza-Gómez^{b,*}

^a División de Anestesiología, Unidad Médica de Alta Especialidad, Hospital de Ginecología y Obstetricia, Instituto Mexicano del Seguro Social, México

^b División de Investigación en Salud, Unidad Médica de Alta Especialidad, Hospital de Ginecología y Obstetricia, Instituto Mexicano del Seguro Social, México

Received 23 September 2014; accepted 21 January 2015

KEYWORDS

Acetazolamide;
Cerebrospinal fluid;
Epidural technique;
Fistula

Abstract

Background: Cerebrospinal fluid cutaneous fistula following spinal anaesthesia is a serious and rare complication which requires a prompt diagnosis. However, the treatment management is not well defined.

Clinical case: Female aged 50 with a stage IIB cervical carcinoma, who had a peridural catheter inserted at lumbar level. Three days after surgery she refers severe headache, which was corroborated by leakage of cerebrospinal fluid through the puncture. She was prescribed antibiotics and acetazolamide 250 mg every 8 hours for five days with a favourable outcome.

Conclusion: In this case, management with acetazolamide and suture of the fistula inhibits cerebrospinal fluid leakage, without the need for a blood patch.

© 2015 Academia Mexicana de Cirugía A.C. Published by Masson Doyma México S.A. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

PALABRAS CLAVE

Acetazolamida;
Fístula;
Líquido
cefalorraquídeo;
Técnica epidural

Acetazolamida en el manejo de la fístula de líquido cefalorraquídeo posterior a analgesia peridural: reporte de caso

Resumen

Antecedentes: La fístula cutánea de líquido cefalorraquídeo secundaria a anestesia espinal es una seria y rara complicación que exige rápido diagnóstico, aunque falta definir la conducta terapéutica. **Caso clínico:** Mujer de 50 años con carcinoma cervical en estadio IIB a la que se le colocó un catéter peridural a nivel lumbar; 3 días después de la cirugía refiere cefalea intensa y se corro-

[☆]Please cite this article as: Juárez-Adame F.M. et al. Acetazolamida en el manejo de la fístula de líquido cefalorraquídeo posterior a analgesia peridural: reporte de caso. Cirugía y Cirujanos. 2015; 83: 43-45.

*Corresponding author: Josefa Ortiz de Domínguez 3194-6, Colonia Agustín Yáñez, Sector Libertad, C.P. 44790, Guadalajara, Jalisco, México. Teléfono: 01 (33) 36-44-30-83.

E-mail address: postmen71@yahoo.com.mx (A. B. Zavalza-Gómez).

bora la salida abundante de líquido cefalorraquídeo en el área de punción. Se da un punto en 8 con Nylon 3-0, antibiótico profiláctico y 250 mg de acetazolamida por vía oral cada 8 h durante 5 días con evolución favorable.

Conclusión: En este caso, la acetazolamida más la sutura de la fístula logra detener la pérdida de líquido cefalorraquídeo sin necesidad de parche hemático.

© 2015 Academia Mexicana de Cirugía A.C. Publicado por Masson Doyma México S.A. Este es un artículo Open Access bajo la licencia CC BY-NC-ND (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Background

The cerebrospinal fluid fistula secondary to epidural anaesthesia refers to abnormal drainage of cerebrospinal fluid from the subarachnoid space to the extracranial compartment and along the spinal axis. It should be suspected in cases of persistent headache that worsens with changes in posture.

The cerebrospinal fluid cutaneous fistula is a rare complication of anaesthetic techniques, of imprecise and multifactorial aetiology, with physiopathological rationale and therapeutic behaviour to be defined. The reported incidence is 1 in 220,000 cases of spinal and epidural anaesthesia¹. Few cases of cerebrospinal fluid cutaneous fistula have been described in the practice of anaesthesia: after accidental dura mater puncture during epidural insertion²⁻⁵, secondary to dural penetration through the epidural catheter³, administration of epidural anaesthesia⁴ or continuous spinal anaesthesia⁵. Other risk factors for the development of fistula have been reported, including the use of epidural or systemic steroids or the multiple attempts to locate the epidural space^{6,7}.

The treatment of this rare complication includes upside down bed rest, fluid restriction, antibiotic prophylaxis and figure-of-eight suture on the puncture site⁴, as well as bed rest in slight Trendelenburg position⁸ or in a lateral position², epidural blood patch^{7,9-16}, lumbar cerebrospinal fluid drainage or surgical closure¹⁴.

We submit a case of successful treatment with acetazolamide and fistula closure with figure-of-eight suture.

Clinical case

Woman, 50 years, diagnosed with cervical cancer in clinical stage IIB, scheduled for total abdominal hysterectomy. In the operating room, after standard monitoring, with the patient in left lateral recumbent position, under aseptic and antiseptic measures, a lumbar epidural catheter was placed in the first attempt and without any complications. An additional dose of anaesthetic via catheter was not necessary. Two hours later, already in the recovery room, the complete regression of sensory and motor block was verified, with no evidence of neurological complications and the epidural catheter was left for 24 hours for the treatment and control of pain after surgery. Three days after the intervention, the patient reported an intense throbbing frontal headache accompanied by nausea, and after the epidural catheter was removed, an abundant leakage of cerebrospinal fluid was observed, which was confirmed by a glucose of 68 mg/dl on

a test strip. Initial treatment was absolute rest, 0° supine, water retention, conventional analgesics and bandages; however, the output of clear liquid through the puncture site persisted, without neurological disorders, so the fistula was closed with Nylon 3-0 with a figure-of-eight suture (Fig. 1), prophylactic antibiotic treatment and oral acetazolamide 250 mg every 8 hours for 5 days, which was effective in stopping the leakage of liquid and reduced the headache, without requiring a blood patch. Eight hours later, the patient was discharged, completely asymptomatic. The cytochemical examination showed 44 mg/dl of protein and 650/mm³ of leukocytes (polymorphonuclear 68%), and the culture reported *Staphylococcus haemolyticus*.

Discussion

The cerebrospinal fluid cutaneous fistula is a rare complication of epidural anaesthesia, but it is potentially serious and difficult to treat. Some authors report that a dural lesion during puncture, the continuous injection of drugs or the rubbing or abrasion of the skin^{10,14,17}, or a systemic inflammatory process⁹ are mechanisms that produce the fistula. Steel et al.¹³ report a case of persistent cerebrospinal fistula in a patient with spina bifida, associated with chronic steroid use and a difficult and traumatic puncture^{13,18,19}; nevertheless, in this case a history of any of them is negative. On the other hand, the fistula usually occurs within 24 hours after the removal of the spinal/epidural catheter, as opposed to three days later in our case. Electrophoresis using B2-transferrin and immunological studies are recommended as diagnosis methods¹⁰. The presence of cerebrospinal fluid was confirmed in the patient by a cytochemical study and due to the abundance and pressure with which it was coming out of the puncture site, which differs from the inadvertent meningeal drilling, in which both a headache and the output of cerebrospinal fluid²⁰ are observed immediately after puncturing.

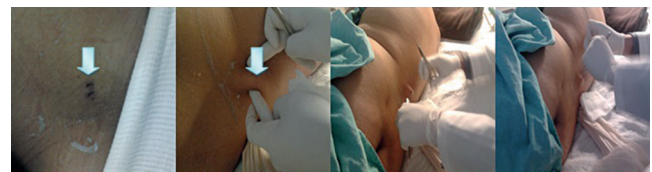


Fig. 1 The figure shows, from left to right: the presence of the fistula and the leakage of cerebrospinal fluid by the pressure of the puncture site; likewise, the successful closure of the fistula.

As an integral part of treatment for a post-puncture headache, compression and fistula closure or autologous blood patching is recommended for reducing the risk of meningitis^{4,7}. The use of acetazolamide as a carbonic anhydrase inhibitor decreases the production of cerebrospinal fluid and repairs the dura mater, thereby possibly preventing the recurrence of the fistula. This effect has been described in the treatment of cerebrospinal fluid fistula from the base of the skull and incidental durotomy^{21,22}, since the only factor associated with the recurrence of rhinorrhoea is the presence of increased intracranial pressure, which may become apparent only after the fistula is repaired²³. Although there are no published works in the medical literature that demonstrate the benefits of acetazolamide in cases of cerebrospinal fluid cutaneous fistula, in our case the response was quick, positive and no blood patch was required, nor was there any need to keep her beyond the 72 hours of hospitalisation required by the postoperative period.

There are few cases of cerebrospinal fluid cutaneous fistula after epidural anaesthesia^{12,24}; nevertheless, the treatment in most of them is the blood patch; on the other hand, several studies have demonstrated the effectiveness of acetazolamide in treating skull fistulas secondary to nasal and brain procedures^{21-23,25}.

Conclusion

In this case of cerebrospinal fluid cutaneous fistula after epidural analgesia, the treatment of headache and loss of cerebrospinal fluid with oral acetazolamide doses of 250 mg every 8 hours, with figure-of-eight suture at the puncture site and in a timely manner by the anaesthesiologist, was successful.

Conflict of interest

All authors declare that no funding from any institution or person was used to carry out the study and declare that there is no conflict of interest related to it.

Bibliography

- Sainz Cabrera H, Alderete Velazco JA, Vilaplana Santaló C. La anestesia epidural continua por vía lumbar: antecedentes y descubrimiento. *Rev Cub Anest Rean.* 2007;6:1-11.
- Jawalekar SR, Marx GF. Cutaneous cerebrospinal fluid leakage following attempted extradural block. *Anesthesiology.* 1981;54:348-349.
- Motsch J, Hutschenreuter K. Cutaneous cerebrospinal fluid fistula associated with secondary puncture of the dura caused by a peridural catheter. *Reg Anaesth.* 1984;7:74-76.
- Ball CG, D'Alessandro FT, Rosenthal J, Duff TA. An unusual complication of lumbar puncture: A CSF cutaneous fistula. *Anesth Analg.* 1975;54:691-694.
- Hullander M, Leivers D. Spinal cutaneous fistula following continuous spinal anesthesia. *Anesthesiology.* 1992;76:139-140.
- Joseph D, Anwari JS. Cerebrospinal fluid cutaneous fistula after labour epidural analgesia. *Middle East J Anesthesiol.* 2001;16(2):223-230.
- Longmire S, Joyce TH 3rd. Treatment of a duro-cutaneous fistula secondary to attempted epidural anesthesia with an epidural autologous blood patch. *Anesthesiology.* 1984;60(1):63-64.
- Lieberman LM, Tourtellotte WW, Newkirk TA. Prolonged post-lumbar puncture cerebrospinal fluid leakage from lumbar subarachnoid space demonstrated by radioisotope myelography. *Neurology.* 1971;21(9):925-929.
- Ornoz Paparoni MI, Carrillo GE, Fuguet Fernández JA, Sánchez Salas RE. Fistula cutánea de líquido cefalorraquídeo. *Rev Fac Med.* 2005;28(2):177-180.
- Chan BO, Paech MJ. Persistent cerebrospinal fluid leak: A complication of the combined spinal-epidural technique. *Anesth Analg.* 2004;98(3):828-830.
- Howes J, Lenz R. Cerebrospinal fluid cutaneous fistula: An unusual complication of epidural anaesthesia. *Anaesthesia.* 1994;49(3):221-222.
- Hosu L, Meyer MJ, Goldschneider KR. Cerebrospinal fluid cutaneous fistula after epidural analgesia in a child. *Reg Anesth Pain Med.* 2008;33(1):74-76.
- Steel AG, Watson BJ, Abdy S, Allen JG. Persistent cerebrospinal fluid leak. *Anesth Analg.* 2004;99(4):1266-1267.
- Holden S, Hedley RM, Wheildon M. Cerebrospinal fluid cutaneous fistula. *Anaesthesia.* 1994;49(9):836-837.
- Whitty RJ, Lazinski D, Carvalho JCA. Large subcutaneous fluid collection attributed to suspected epidural catheter leak. *Anesth Analg.* 2007;104(1):230-231.
- Kumar V, Maves T, Barcellos W. Epidural blood patch for treatment of subarachnoid fistula in children. *Anaesthesia.* 1991;46(2):117-118.
- De Tommaso O, Caporuscio A, Tagariello V. Neurological complications following central neuraxial blocks: Are there predictive factors? *Eur J Anaesthesiol.* 2002;19(10):705-716.
- Bansal S. Fluid leak from epidural puncture site: A diagnostic dilemma. *Anesth Analg.* 2004;99(5):1577.
- Katz J. Treatment of persistent cerebrospinal fluid leak with an epidural blood patch. *Anesth Analg.* 2004;99(4):1266.
- Cortínez FI, Muñoz LH. Cefalea posterior a una punción meníngea durante analgesia peridural para trabajo de parto. *Rev Chil Anest.* 1998;27(3):14-18.
- Mokri B. Intracranial hypertension after treatment of spontaneous cerebrospinal fluid leaks. *Mayo Clin Proc.* 2002;77(11):1241-1246.
- Corbett JJ, Mehta MP. Cerebrospinal fluid pressure in normal obese subjects and patients with pseudotumor cerebri. *Neurology.* 1983;33(10):1386-1388.
- Santos-Pérez J, Alonso-Mesonero M. Fistulas de líquido cefalorraquídeo. En: Llorente Pendas JL, Álvarez Marcos C, Núñez Batalla F, editores. *Otorrinolaringología. Manual clínico.* Médica Panamericana; 2011. p. 375-382.
- Joseph D, Anwari JS. Cerebrospinal fluid cutaneous fistula after labour epidural analgesia. *Middle East J Anesthesiol.* 2001;16(2):223-230.
- Abrishamkar S, Khalighinejad N, Moein P. Analysing the effect of early acetazolamide administration on patients with a high risk of permanent cerebrospinal fluid leakage. *Acta Medica Iranica.* 2013;51:467-471.