Dural sinus thrombosis following epidural analgesia for delivery: a clinical case

Marco Aurelio Dornelles a,b,c,*, Luis M. Pereira c

a Sociedade Brasileira de Anestesiologia, Rio de Janeiro, RJ, Brazil
b Sociedade Portuguesa de Anestesiologia, Lisboa, Portugal
c Hospital de Faro, Centro Hospitalar do Algarve, Algarve, Portugal

Received 9 March 2016; accepted 26 July 2016
Available online 24 August 2016

Abstract

Background and objectives: Neurological complications of spinal anesthesia are rare conditions. Headache caused by low pressure of the cerebrospinal fluid is one of the most frequent, which occurs after post-dural puncture. A comprehensive history and physical exam must be carried out before making the diagnosis of Post-Dural Puncture Headache (PDPH) and additional tests are necessary to exclude the possibility of developing serious neurological complications such as Dural Sinus Thrombosis (DST). According to the Case Report a differential diagnosis between Dural Sinus Thrombosis with PDPH is discussed.

Case report: A 22 year-old lady, ASA Physical Status Class I was admitted at 39 weeks of gestation for delivery. For labor pain relief she requested epidural for analgesia, but unfortunately accidental dural puncture occurred. She developed an occipital headache and neck pain in the second day postpartum which was relieved by both lying down and supporting treatment such as rehydration, analgesics and caffeine. On day third postpartum she was discharged without complaints. On day fifth postpartum the pain returned and became more intense and less responsive to oral analgesics. She was admitted to the hospital to do a complete neurological and image investigation that showed a lesion consistent with the diagnosis of cortical vein thrombosis and Dural Sinus Thrombosis (DST). She was treated with oral anticoagulants. After two days, a repeated magnetic resonance image (MRI) showed partial canalization of the central sinus thrombus. The patient was discharged from hospital five days after her admission without any of the initial symptoms.
Conclusion: The report describes a patient who developed severe headache following continuous epidural analgesia for delivery. Initially it was diagnosed as PDPH, however with the aid of MRI the diagnosis of DST was later established and treated. DST is a rare condition and is often underdiagnosed. Because of its potentially lethal complications, it should always be considered in acute headache differential diagnosis.

© 2018 Sociedade Brasileira de Anestesiologia. Published by Elsevier Editora Ltda. This is an open access article under the CC BY-NC-ND license (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Trombose de seios durais após analgesia peridural para parto: caso clínico

Resumo

Justificativa e objetivos: As complicações neurológicas da raquianestesia são condições raras. A cefaleia causada pela baixa pressão do fluido cerebrospinal é uma das mais frequentes que ocorre após a punção dural. Anamnese completa e exame físico geral devem ser realizados antes de fazer o diagnóstico de cefaleia pós-punção dural (CPPD) e testes adicionais são necessários para excluir a possibilidade complicações neurológicas graves, como trombose de seios durais (TSD). De acordo com o relato do caso, discutiremos o diagnóstico diferencial entre TSD e CPPD.

Relato de caso: Paciente de 22 anos, estado físico ASA I, foi admitida com 39 semanas de gestação para o parto. Para alívio da dor do trabalho de parto, a paciente solicitou analgesia peridural, mas infelizmente ocorreu uma punção dural acidental. A paciente desenvolveu cefaleia occipital e dor cervical no segundo dia pós-parto — ambas aliviadas com repouso e terapia de suporte, como reidratação, analgésicos e cafeína. No terceiro dia pós-parto, a paciente recebeu alta sem queixas. No quinto dia pós-parto, a dor retornou e ficou mais intensa e com pouca resposta aos analgésicos orais. Ela foi admitida no hospital para uma completa investigação neurológica e de imagem que mostrou uma lesão compatível com o diagnóstico de trombose venosa cortical e TSD. A paciente foi tratada com anticoagulantes orais. Após dois dias, a repetição de ressonância nuclear magnética (RNM) mostrou canalização parcial de trombo do seio central. A paciente recebeu alta hospitalar cinco dias após a admissão, sem quaisquer dos sintomas iniciais.

Conclusão: O caso descreve uma paciente que desenvolveu cefaleia grave após epidural contínua para o parto. Inicialmente ela foi diagnosticada como CPPD, contudo com o auxílio da RNM foi estabelecido o diagnóstico tardio de TSD. TSD é uma condição rara e frequentemente subdiagnosticada. Ela deve sempre ser considerada como diagnóstico diferencial de cefaleia aguda em decorrência de suas complicações potencialmente letais.

© 2018 Sociedade Brasileira de Anestesiologia. Publicado por Elsevier Editora Ltda. Este é um artigo Open Access sob uma licença CC BY-NC-ND (http://creativecommons.org/licenses/by-nc-nd/4.0/).

Introduction

The use of epidural analgesia (EP) to provide pain relief for labor and delivery has become increasingly popular. During the placement of an epidural needle or the catheter, recognizable inadvertent dural puncture may occur in 0.5–10% of the cases depending on the experience of the anesthetist.\(^1\) On the other hand, unrecognized dural puncture occurs in about 1.5% of cases.\(^2\) Thus it is not uncommon for a patient to develop a persistent postpartum headache following epidural analgesia. Before treating the headache in such patients one has to consider other conditions which can also produce headache. This report describes a patient whose headache was thought to be a spinal headache; however, the cause of her headache was subsequently diagnosed as Dural Sinus Thrombosis (DST).

Case report

A 22-year-old lady, first pregnancy, ASA Physical Status Class I was admitted at 39 weeks of gestation for delivery. The antenatal period, physical examination and blood pressure were normal. For labor pain relief she requested EP for analgesia. Under sterile conditions, using the loss of resistance technique, a 17 Tuohy epidural needle was inserted into L4–L5 interspace. Unfortunately, accidental dural puncture occurred. The needle was removed and replaced in the L3–L4 interspace where the epidural catheter remained successfully. A 10mL bolus dose of Ropivacaine 2mg.mL\(^{-1}\) (20mg) was administered with no untoward effects. Shortly after she progressed to the second stage of labor and had a spontaneous vaginal delivery of a healthy baby.
complications. The largest ever prospective study into the
major complications of EP and spinal anesthetics published
concludes that the estimated risk of permanent harm is
lower than one in 20,000 and that the risk of permanent
injury is about one in 50,000.3

DST is an uncommon complication of pregnancy with an
incidence of between 1:3000 and 1:10,000 cases. In the
International Study on Cerebral Vein and Dural Sinus
Thrombosis (ISCVT), 4.3% of patients died during acute phase
of DST and 3.4% within 30 days from symptom onset.4

Factors that predispose to DST include the hyperco-
agulable state of pregnancy and hereditary conditions.
Thrombophilia screening (proteins C and S, antithrombin
III, lupus anticoagulant, anticardiolipin antibodies, factor V
Leiden, and G20210A mutations) are recommended. Sinus
thrombosis related to pregnancy usually occurs from the
third trimester to four weeks postpartum and the main
symptoms include headache, seizures, impaired conscious-
ness, nausea, and vomiting.5

CT scanning is the investigation of choice in the acute
neurologic situation, often revealing a high density crescent
of fresh blood, but when the hematoma becomes isodense
on CT, MRI is a more sensitive investigation for detection
and optimal delineation.6

The treatment of patients with DST involves support-
ive therapy and sometimes anti-seizure medication. Specific
therapy for DST involves anticoagulation or thrombolytic
therapy.4

The individual time course is highly variable and the
death rates series range between 5% and 30%, and probably
depend more on case mix than on treatment.5

The occurrence of any complication implies an interac-
tion of factors related to the blockade itself and known
or unknown preexisting conditions in the patient. It is
often difficult, if not impossible, to determine the exact
etiology, but unfortunately for the anesthetist, regional
blockade usually incriminated till proven otherwise.
A thorough history is important to exclude other possible
diagnoses before assuming that the headache is of
spinal origin. The common and serious causes of persistent
headache in the puerperium after regional anesthesia are1:
spinal headache; migraine; pregnancy-induced hyperten-
sion; menigitis; cerebral tumor; subarachnoid hemorrhage;
subdural hematoma; cerebral vein thrombosis. Before the
development of seizures or neurological signs it is difficult to
distinguish headache of DST from ordinary spinal headache
(PDPH). However, there are some distinguishing features of
DST: the headache seems to be throbbing in nature, accentu-
ated by movement of the head and assumption of the sitting
position, and may be associated with nausea and vomiting.
The patient may manifest lethargy, a feeling of numbness
and focal non-specific weakness. In the presence of atypical
spinal headache following spinal or EP analgesia, MRI may be
used to rule out the possibility of DST.7 Otherwise, the use of
an Epidural Blood Patch (EBP) to treat spinal headache after
accidental dural puncture is well recognized, and although
the success rate is as high as 90%,1 there is evidence to sug-
ject that this treatment can cause DST as the same way
after a diagnostic lumbar puncture due to persisting lumbar
meningeal wound.1

In conclusion, DST can mimic Post-Dural Puncture
Headache (PDPH) and should always be considered in the

Discussion

A consequence of the increased use of regional anes-
thesia worldwide is an inevitable increase in associated

She remained well after delivery and continued to do so
for the next 24 h. However, on the second day postpartum,
she developed an occipital headache and neck pain, which
were both relieved by lying down. Conservative treatment
with bed rest, analgesics and i.v. fluid administration to pre-
vent dehydration were advised, but she did not remain in
bed and walked frequently. On day third postpartum she
was discharged without complaints.

She rested five days at home, but the pain returned
and became more intense and less responsive to oral
analgesics. She presented to the emergency room com-
plaining of occipital and parietal headache, nausea and
sometimes vomiting. The pain became worse on standing
up. Sometimes it began at the occipital region and also
left side of the skull. She also complained of right arm
weakness and some paresthesia and jerky movements. She
was admitted to the hospital on the Stroke Unit to do a
complete neurological and imagiologic investigation and
other analysis. There was no focal papilledema and the CT
scan was normal. However, an Electroencephalogram (EEG)
revealed focal slowing in the left parietal region. Further
investigations with Magnetic Resonance Imaging (MRI)
revealed a region of increased T1 signal involving the su-
perior sagittal sinus and the left cortical vein with an obvious
lesion consistent with the diagnosis of cortical vein throm-
bosis and Dural Sinus Thrombosis (DST) (Fig. 1). Heparin
infusion was initiated and oral Coumadin therapy also until
the goal International Normalized Ratio (INR) of 2–3 was
reached. After 2 days a repeat MRI showed partial cana-
lization of the central sinus thrombus. The patient was
discharged from hospital five days after her admission with-
out any initial symptoms. She is followed up by a stroke
consultant with regular INR monitoring for 6 months and she
is now headache-free and asymptomatic.

Figure 1  Magnetic resonance venogram – axial view demon-
strating reduction of flow in longitudinal sinus (a) and lack of
flow in left superior cerebral vein (b).
differential diagnosis, especially the worsening headache and change in pain character with some neurological symptom associated with a failure of Epidural Blood Patch, indicating increased intracranial pressure.

**Conflicts of interest**

The authors declare no conflicts of interest.

**References**


