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Case report

Case report: Subdural anesthesia in the obstetric patient[☆]



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ABSTRACT

Introduction: Subdural anesthesia is a relatively frequent complication though seldom recognized. It has a broad spectrum of presentations ranging from an unexpectedly high sensory block with limited motor block, to substantial hemodynamic and respiratory involvement. **Case presentation:** A 22-year old woman undergoing cesarean section under epidural anesthesia with evidence of long-lasting higher than expected sensory block and respiratory distress.

Conclusion: Neuraxial anesthesia comprises a number of versatile and safe techniques, though not exempt from complications including subdural anesthesia. We should be aware of this possibility in our clinical practice, know the risk factors and the diagnostic criteria.

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Informe de caso: Anestesia subdural en la paciente obstétrica

RESUMEN

Introducción: La anestesia subdural es una complicación de la anestesia neuroaxial relativamente frecuente pero poco reconocida, tiene un espectro de presentación bastante amplio que va desde un bloqueo sensitivo inesperadamente alto con poco bloqueo motor, hasta compromiso hemodinámico y respiratorio importante.

Presentación del caso: Mujer de 22 años que es llevada a cesárea con anestesia epidural, con evidencia de bloqueo sensitivo más alto de lo esperado, de larga duración y dificultad respiratoria.

Palabras clave:

Espacio subdural

Anestesia epidural

Cesárea

Bloqueo nervioso autónomo

Factores de riesgo

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Conclusión: La anestesia neuroaxial es un conjunto de técnicas versátiles y seguras, aunque no exentas de complicaciones como lo es la anestesia subdural. En la práctica clínica debemos estar atentos a esta posibilidad, conocer los factores de riesgo y los criterios diagnósticos.

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Introduction

Subdural anesthesia is a relatively frequent complication from neuraxial anesthesia though seldom recognized,¹ with a spectrum of presentation of variable severity. According to Lubenow's studies the overall incidence among the general population has been estimated at 0.87%² and in obstetric patients undergoing epidural anesthesia the incidence is estimated at 0.024%.³ However, in studies with contrast medium, values as high as 7–11%^{1,4-6} have been identified. This case illustrates an unusual presentation, the risk factors involved, and the preventive actions that could be adopted.

The subdural space has been classically described as a virtual space occupied by serous fluid contained between the dura mater and the arachnoid. Consistent with this anatomical denomination it could be similar to other serous cavities such as the pericardium or the pleurae; this means two layers in contact with a serous structure that promotes friction in the absence of any intercellular bonds. However, recent studies in dead human bodies and using electron microscopy show that this space does not actually exist and if present is the result of pathologic or iatrogenic factors.⁷⁻¹⁰

Histologically speaking, the “subdural space” is made up by a neuroepithelium of elongated, spindle-shaped and branched cells with lax intercellular bonds surrounded by few collagen fibers and some blood vessels resulting in low mechanical resistance^{11,12} (Figs. 1 and 2). The subdural space is localized between the most inner segment of the dura mater – a very tough tissue composed of 80 layers of web-shaped

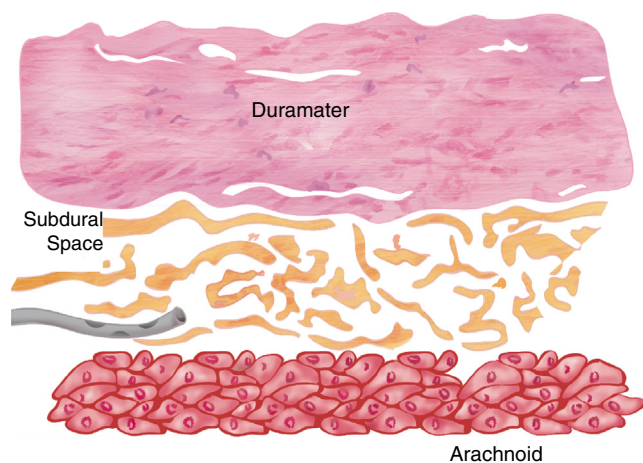


Fig. 1 – Graphical representation of the meningeal epithelia and their relationship to the subdural neuroepithelium. Source: Authors.

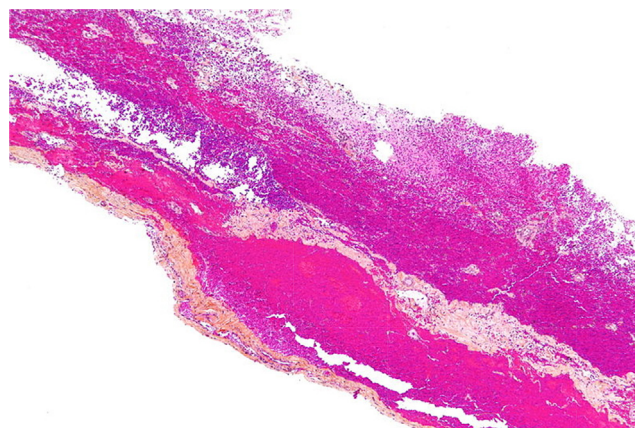


Fig. 2 – Subdural hematoma seen under optic microscopy to identify the plane of separation of the neuroepithelium. Source: Nephron <https://goo.gl/DDG616>. Reproduction with permission.

collagen fibers that that run in multiple directions and the arachnoid mater composed of several cellular planes connected by desmosome-type specialized narrow intercellular bonds that make it the primary barrier against the passage of substances.¹² The subdural neuroepithelium is concentrically oriented around the dural sac and, in contrast to the epidural space, it is not limited by the foramen magnum. This is the most frail tissue inside the meninges that may sustain injuries and result in a pathological space whose size and shape are determined by the strength of the generating force and represents a critical factor for the direction and distribution of any substances administered in that area. In the case of local anesthetic agents this accounts for the huge variability of clinical presentations.^{2,5,6} Finally the clinical presentation of the anesthetic block is determined by the meningeal structures permeated. If the dura mater is not permeated, the characteristics will mimic an epidural anesthesia but if the dura mater is disrupted while the arachnoid is preserved, the clinical presentation will resemble a subdural anesthesia. Lastly, if the arachnoid is disrupted and the anesthetic agent deposits in the subarachnoid cavity (intrathecal), the anesthesia will be spinal or subarachnoid.^{13,14}

Case report

22-year old patient, 39 weeks in her first pregnancy, 80 kg of body weight, previously healthy, scheduled for cesarean section due to a breech presentation, negative history, vital signs:

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