Letters to the Editor

Postmortem image-guided biopsy for less-invasive diagnosis of congenital intracranial teratoma

In certain cases, postmortem magnetic resonance imaging (PM-MRI) can obviate the need for formal autopsy and dissection by providing high-quality imaging which can guide tissue sampling. Percutaneous needle organ biopsy to obtain tissue samples for microscopic examination, as part of the less-invasive perinatal autopsy, has been described previously and endoscopic- or laparoscopic-guided sampling has also been piloted. We present a case of congenital malformation in which PM-MRI guided a less-invasive tissue sampling procedure and, consequently, a definitive diagnosis of intracranial teratoma was achieved, obviating the need for conventional autopsy.

A 31-year-old woman was referred at 18 weeks of gestation for follow-up of monochorionic diamniotic twins. Ultrasound examination demonstrated one structurally normal twin and one with a large heterogeneous echogenic mass that distorted the brain anatomy causing ventriculomegaly. Antenatal MRI at 27 weeks' gestation confirmed the presence of a large heterogeneous mass, with areas of increased signal intensity, that distorted the intracranial structures and face (Figure 1a,c,e), and

![Figure 1 Axial (a,b), sagittal (c,d) and coronal (e,f) images of fetal brain on antenatal magnetic resonance imaging (MRI) at 27 weeks' gestation (a,c,e) and on postmortem MRI (PM-MRI; b,d,f). Antenatal MRI confirmed presence of large intracranial mass distorting normal intracranial structures, causing expansion of the skull vault. The mass can be seen herniating through the middle cranial fossa into the neck (arrowhead), involving the ipsilateral facial structures, and expanding beyond the lateral margin of the face and extending into the posterior fossa. Ventriculomegaly and skull vault expansion can be seen on antenatal MRI (a,c,e), but the heterogeneous nature of the mass is best appreciated on PM-MRI (b,d,f), when it can be seen to contain both solid and cystic elements and occupy almost the entirety of the intracranial space, with contralateral compression of atrophic cerebral parenchyma.](image-url)
Axial post-mortem magnetic resonance imaging confirmed extension of intracranial mass into the neck; biopsy was therefore obtained through a small skin incision in the neck (a), without opening of the skull, with a good cosmetic result (b). (c,d) Histological photomicrographs demonstrated typical features of immature congenital teratoma, with mixed populations of tissue from all three germ-cell layers, including immature and disorganized neuroepithelial tissue (hematoxylin and eosin stain, original magnifications ×20 (c) and ×100 (d)).

was interpreted as an intracranial teratoma. No additional abnormalities were found. Amniocentesis was performed for karyotyping, the results of which were normal (46,XX). The parents opted for termination of pregnancy following increasing head growth of the affected twin, associated with progressive cervical shortening. Selective feticide was performed at 30 + 5 weeks' gestation using pericardial injection of potassium chloride.

PM-MRI was performed as an alternative to standard autopsy, at parental request. PM-MRI confirmed the presence of a large heterogeneous intracranial mass, comprising both solid and cystic elements, occupying almost the entirety of the intracranial space with contralateral compression of atrophic cerebral parenchyma. The mass herniated through the middle cranial fossa into the neck, and involved the ipsilateral facial structures (Figure 1b,d,f).

As opening the skull and excising the mass would be difficult en bloc, after discussion of the case in our radiology–pathology meeting, we decided to biopsy the neck lesion, which was continuous with the intracranial component. The PM-MRI findings allowed a targeted tissue biopsy to be obtained via a 2-cm incision on the left side of the neck (Figure 2a). Histological examination of the biopsy specimen revealed typical features of a congenital immature teratoma (Figure 2c,d).

This case demonstrates the clinical utility of PM imaging, followed by image-guided limited PM tissue sampling of a specific lesion to confirm the antenatal findings and provide a definitive histological diagnosis, while negating the need for conventional invasive autopsy. Congenital intracranial teratomas are rare and carry a poor prognosis which may lead to termination of pregnancy; following which tissue diagnosis is required. When parents do not consent to a standard open approach, options for investigating fetal pathology are limited and, although PM-MRI can be helpful, tissue sampling is required for a definitive diagnosis.

Image-based less-invasive approaches are increasingly being accepted among both parents and medical professionals. We therefore believe that, in certain instances such as this, less-invasive image-guided targeted tissue sampling will be able to provide the necessary histological information whilst also meeting parental expectations and preferences. We acknowledge that the skills required to interpret the results of PM imaging need to improve, and that less-invasive autopsy may not yet be widely available. We encourage the use of a multidisciplinary team approach in order to provide the best imaging, tissue sampling and definitive diagnosis for such patients.

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