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The spectrum of radiologic abnormalities in the neonatal CNS.

S J Gaskill

AJNR Am J Neuroradiol 1992, 13 (4) 1272
http://www.ajnr.org/content/13/4/1272.citation

This information is current as of April 17, 2024.

LETTERS

Contrast-Enhanced CT of Acute Isodense Subdural Hematoma

The case of "isodense" subdural hematoma reported by Boyko et al (1) is interesting for the diffuse enhancement of the subdural hematoma, and for the discussion that accompanies it.

It appears inappropriate, however, for Figure 1A and 1B to be published with the legend which states that there was no "identifiable extracerebral fluid collection." With modern CT scanners and good technique, the "isodense" subdural collection does not exist. What is "isodense" with white matter is slightly decreased in density in comparison to gray matter. What is "isodense" with gray matter, is higher in density than white matter. Sometimes an experienced neuroradiologist needs to extrapolate from the identification of the finger-like low-density subcortical white matter tracts where the surface of the brain should be, in order to interpret the subdural collection that is isodense with gray matter.

This type of case is illustrated in Figure 1A and 1B. Although less experienced neuroradiologists or those who do not pay attention to detail may not see an identifiable extracerebral fluid collection, this extracerebral collection will be well seen by experienced neuroradiologists.

There is no question that the diffuse enhancement of the collection is interesting, and that the subdural illustrated in Figure 1C and 1D will be interpreted by all, including inexperienced people. However, to claim that the subdural collection cannot be identified without contrast, as seen in 1A and 1B, is incorrect. It is unfortunate that this misconception was published in a journal devoted to neuroradiology. A significant number of our readers should be able to distinguish the subdural collection in Figure 1A and 1B, and measure its size and extent. Neuroradiology as a distinct specialty exists to correctly interpret Figure 1A and 1B.

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1. Boyko OB, Cooper DF, Grossman CB. Contrast-enhanced CT of acute isodense subdural hematoma. *AJNR* 1991;12:341–343

Reply

I would like to thank Dr Fox for his comments concerning our recent article on acute isodense subdural hematoma (1). He points out a possible poor choice of wording for Figure 1A and B "without *an* identifiable extracerebral fluid collection." But Dr Fox has taken a subtle liberty by inserting "no" in front of "identifiable extracerebral fluid collection" paraphrasing the text of the figure legend. The phrase "without *an* identifiable extracerebral fluid collection" was used to imply that a neurosurgical decision was deferred until further delineation with contrast of the entire pathologic process could be made in the acute trauma setting of a comatose patient. The wording was intended to allow for retrospective analysis of the non-contrast image by readers of the Journal.

The intent of the case report was not meant to challenge Dr Fox's assertion that the "isodense" subdural collection does not exist, but prior to the 1990 neuroradiologic literature, it has been an observation documented by numerous experienced neuroradiologists. Possibly, we should reformulate our terminology and with modern CT scanners refer to the concept of "nearly isodense subdural hematoma." I appreciate Dr Fox bringing this to the attention of the *AJNR* readers. He is correct in stating that, for younger trainees, the utility of following the finger-like projections of subcortical white matter to the cortical gray surface may be helpful in trying to identify gray matter shifted from the dura by a fluid collection such as a hematoma.

I do know that there has been marked improvement in CT scanner technology since this case was performed, and possibly, under a similar circumstance of disseminated intravascular coagulation due to trauma, this diagnostic dilemma of "near isodensity" may disappear. I await such a case to again be reported with modern CT scanners.

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Unusual MR and CT Appearance of an Epidermoid Tumor

This paper is a concise, well-illustrated report of an unusual manifestation of an epidermoid tumor (1). It describes an epidermoid that is hyperdense on unenhanced CT, hypointense on T1-weighted spin-echo MR, and markedly hypointense on T2-weighted spin echo MR. At surgery, a mass containing yellowish, dense material resembling "compressed wax" was found. The cavity contained epithelial debris, crystals of cholesterol, and large amounts of keratin. No calcification was evident. The authors discuss the various possibilities to account for the MR appearance and, although they do not explicitly state so, they apparently conclude that the low signal intensity is most probably due to low hydration, high protein content, and high viscosity of the secretions, rather than paramagnetic effects.

They further state that there has been no previous report of an epidermoid tumor with these MR and CT appearances.

I fully agree with their observations, conclusions, and that this type of epidermoid tumor has not been previously reported. I merely wish to add that in a previous report of ours on seven Rathke cleft cysts, we discussed one case that was very similar in all respects (2). Our case differed in that the mass was not as dense on CT, nor as hypointense on MR. The surgical description of the material contained within the cyst was strikingly similar (our case 5, Fig. 3). It is also interesting that Russell and Rubinstein state in their textbook that suprasellar epidermoids, craniopharyngiomas, and Rathke cleft cysts share many common histologic features (3). They state, "Although suprasellar epidermoid cysts have been described as distinct from suprasellar craniopharyngiomas, it seems doubtful whether any valid criterion supports such a separation, at least from the histologic viewpoint." This raises the question whether the epidermoid reported by Gualdi et al, and the Rathke cleft cyst reported by us may be transitional forms of variants of the same type of lesion.

As the authors have indicated, there have been previous reports (4, 5) of a similar pattern of MR signal intensities in chronically inspissated sinonasal secretions. What all these observations in effect show is that MR signal intensity is determined not so much by the pathology of the lesion, but rather the contents of the cyst. Any cyst or cavity that by its nature has the capacity to accumulate highly proteinaceous or mucinous material can likely attain this appearance.

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Editor's note: This letter was sent to Dr Gualdi for reply but to date no response has been received.

The Spectrum of Radiologic Abnormalities in the Neonatal CNS

The recent article "Maternal cocaine abuse: the spectrum of radiologic abnormalities in the neonatal CNS" (*AJNR* 1991;12:951–956) included a case of "an intraspinal lipoma that communicated with a cutaneous ectopic penis at the level of the lower thoracic spine." In fact, this is an entity called a neuroectodermal appendage (1). We believe these develop as extensions of congenital dermal sinus tracts that result from a failure of the neuroectoderm to separate from the epithelial ectoderm of the primitive medullary tract. With neuroectodermal appendages, the epidermal growth extends both toward and away from the epithelial surface. The important feature of these entities is that they extend to the underlying nervous tissue (when they occur in the midline) and will affect the developing nervous system if not surgically excised from the involved nervous elements. Pathology (described as a teratoma) is typical as there are usually elements of skin, fat, bone, and nervous tissue in these appendages.

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Reply

Dr Gaskill's paper on neuroectodermal appendages states "that there have been no reports in the literature of bony elements or even cartilagineous elements in association with these tails." Pathologically, our lesion consisted of "a penis, a scrotum, cartilage and bone, bone marrow, nerves, lymph nodes, skin, lipomatous skin tag, and adipose tissue." None of the previously reported neuroectodermal appendages demonstrated organ formation and they all had a pig tail like appearance. While neuroectodermal appendages are an outgrowth of congenital dermal sinus tracts, I believe our patient had congenital dermal sinus tract with an associated teratoma, rather than the usual dermoid or epidermoid. Our pathologists cannot be swayed from their final diagnosis of a mature teratoma exhibiting organ formation. Developmentally, these lesions are related. If Dr Gaskill would consider this a variant of a congenital dermal sinus tract I could agree.

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