

# Copper Beaten Skull

## IMAGE QUIZ

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### Clinical History

A 6-year-old child presented with a history of progressive diminishing of vision in both eyes for the past 2 years.



What is the classical description of the above X-ray appearance and seen in which condition?

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## Discussion

The appearance is called copper beaten skull or brass beaten skull. This is seen due increased to the prominence of convolitional markings or gyral impressions of the brain on the inner table of the skull seen throughout the skull vault. This appearance is seen in children with chronic raised intracranial pressure associated with conditions such as craniosynostosis, obstructive hydrocephalus, and intracranial masses and hypophosphatemia.<sup>[1]</sup>

### Differential diagnosis

#### *Convolitional markings*

Convolitional markings are normal impressions of the gyri on the inner table of the skull. These convolitional markings may be normal during periods of rapid brain growth between age 2-3, and 5-7 years. They become less prominent after approximately 8 years of age. These are usually confined to the posterior part of the skull's inner table.<sup>[2]</sup>

#### *Luckenshadel skull*

It is a dysplasia of the membranous skull vault and is associated with Chiari II malformations. The inner table is more affected than the outer, with regions of apparent thinning (corresponding to the nonossified fibrous bone) of the skull vault. If particularly severe, with the individual lacunae coalescing into larger defects the term craniofenestra is used.



Beaten copper bottom

They lie in the thickest part of frontal, parietal and upper occipital bone. The condition is self-limiting, typically resolving after 6 months of age.<sup>[1]</sup>

There are various skull appearances, which can be associated with various syndromes like beaten silver skull in curzons syndrome, tram-line appearance in Sturge-Weber syndrome, calcification of falx cerebri in basal cell nevus syndrome.<sup>[3]</sup>

#### *Craniosynostosis*

It refers to premature closure of the cranial sutures. The skull shape then undergoes characteristic changes depending on which sutures close early. The sagittal suture is most commonly involved (50%), where the lateral growth of the skull is arrested while anteroposterior growth continues, producing a narrow elongated skull known as scaphocephaly (meaning boat-shaped) or dolichocephaly. As seen in the present case, the next most common sutures in terms of involvement are: Coronal-20%; lambdoid-5% metopic-5%.

#### *Obstructive hydrocephalus*

It (also known as non-communicating hydrocephalus) is simply hydrocephalus due to obstruction of cerebrospinal fluid flow out of the ventricular system.

#### *Intracranial masses*

In children <18 months, the presence of a diffuse copper-beaten pattern on skull radiography.<sup>[3]</sup>

Additional findings associated with a chronic increase in intracranial pressure include macrocrania, splitting of the sutures, skull demineralization and erosion or enlargement of the sellaturcica. Splitting of sutures. The appearance is more frequent in children with complex, rather than simple, craniosynostosis.

Acraniosynostosis study group showed a preoperative beaten copper pattern incidence of 71.6% and an increased incidence during the period of rapid brain expansion in the first 3 years of life. Note, however, that the presence of such a pattern had no significant long-term effect on patient intelligence levels.<sup>[4]</sup>

## Conclusion

Though skull X-ray is rarely done these days, still provides significant information that is helpful in finding pathologic conditions and appreciating their extents.

The presence of beaten copper skull appearance may signify a disturbance in normal brain development and when one sees the beaten copper appearance, other features of raised Intracranial pressure has to be looked into and investigated.

## References

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