

# Vacuum Suction via Neonatal Face Mask as a Treatment Modality for Neonatal Skull Depression

Lau Sau Ning Sarah, Hung Gi Kay Zita,  
Cheng King Fai Kevin, Ho Wai Shing Wilson

Department of Paediatrics and Adolescent Medicine, Hong Kong Children's Hospital

Department of Neurosurgery, Hong Kong Children's Hospital

香港兒童醫院  
Hong Kong Children's Hospital

## Introduction

Skull depression in a newborn delivered by cesarean section is a distinctly rare condition (reported incidence 3/10000). The fontanelle and low calcium content in the fetal skull facilitates plasticity in utero and during the process of delivery. The cause for skull depression in a newborn without instrumentation is puzzling. These 'congenital moulding depressions' or 'spontaneous intrauterine skull fractures' are thought to be a consequence of continued intra-uterine mechanical stresses on the fetal skull (in prolonged occipito-transverse position [see Fig A&B]) by structures such as a prominent sacral promontory, uterine fibroids, exostosis of the lumbar vertebrae, or pelvic abnormalities.



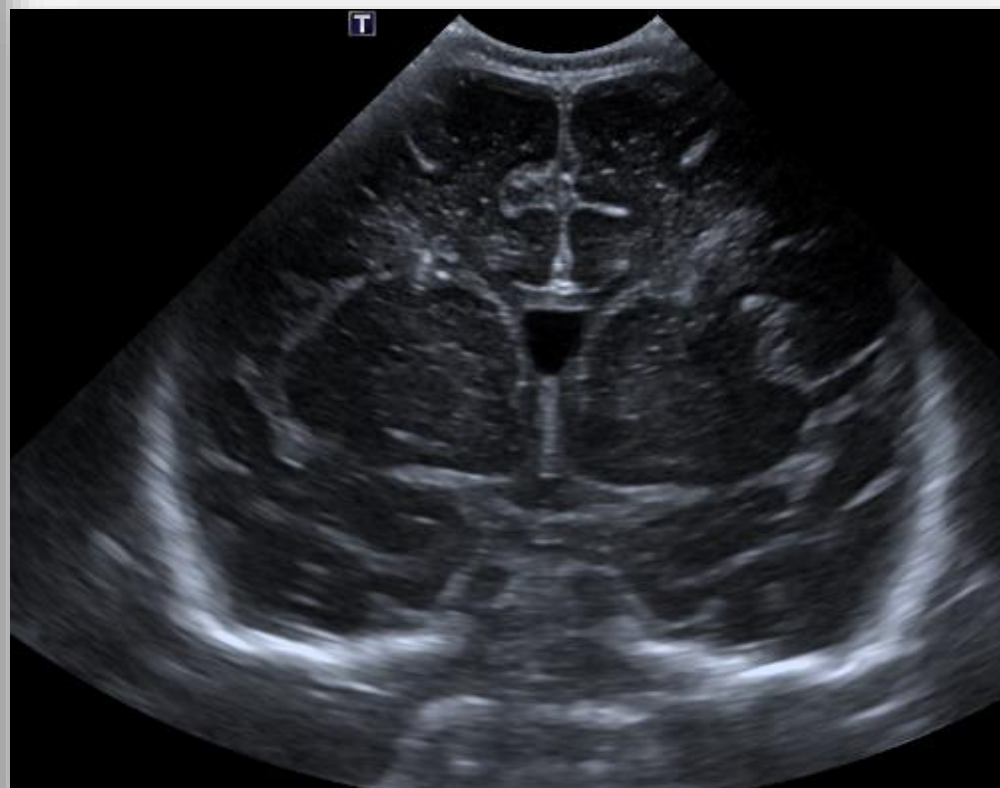
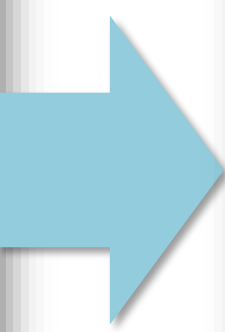
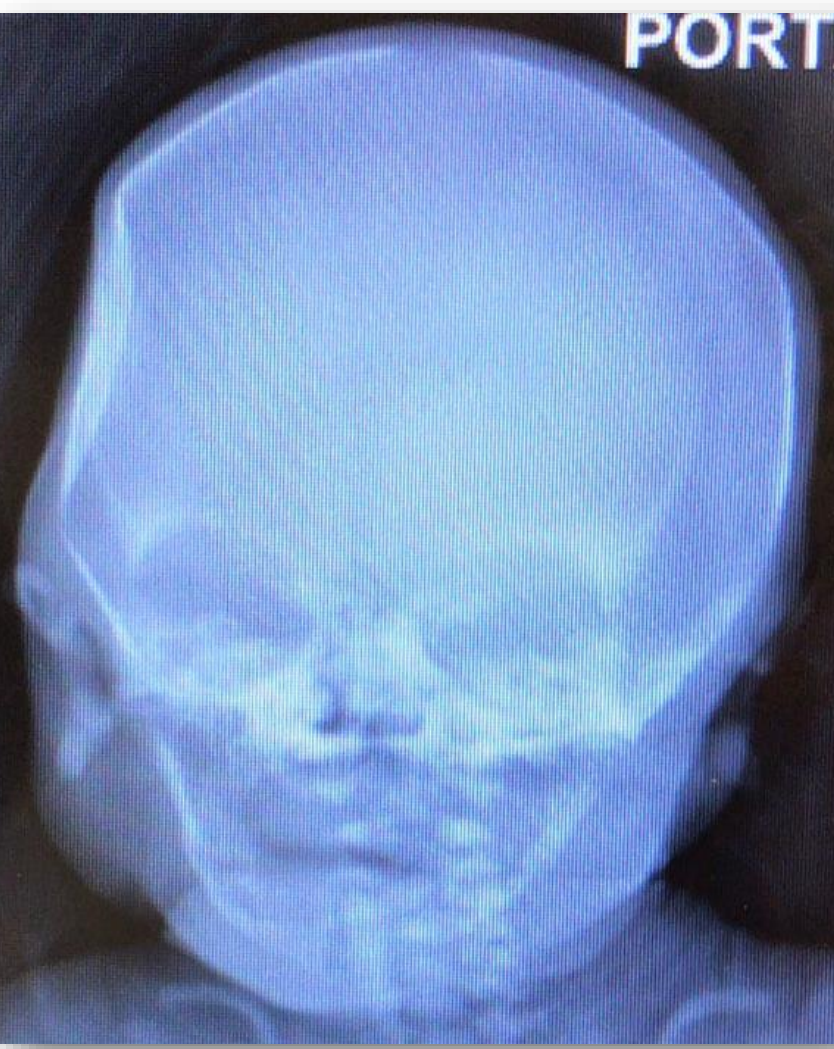
Controversies exist as to the management of these 'ping pong fractures' which are believed to have retained continuity of the bony contour in the skull due to its malleability.

For Neurosurgical intervention	For Conservative
Persistent pressure causing cerebral injury, decrease in cerebral blood flow, secondary epilepsy	No evidence of secondary ill effects from skull depression
Physiognomic and psychological damage in a growing child	Spontaneous moulding of skull occurs within 6 months
Carer worry and stress	No associated neurosurgical risks/scarring



Some methods for manual reduction include suction via obstetric ventouse cup (left), via syringe connected to neonatal face mask (right), via breast milk pump or percutaneous screw. Ventouse cups in HA hospitals are metallic. Plastic ventouse cups are not commercially available in Hong Kong.

We constructed a 'vacuum cup' using neonatal face mask connected to wall suction. 30kPa negative suction was applied and the 'ping pong fracture' was successfully reduced. Post procedure the patient had no ill skin effects nor intracranial bleeding on bedside USG. Our method is considered superior as the suction force is controllable, measurable and can be gradually titrated up. Neonatal face masks are readily available in NICU, and its use ensures better moulding to baby's scalp surface for generation of negative suction force and minimizes scalp injury and subcutaneous haematoma formation.



## Conclusion

Although most untreated neonatal skull depressions are expected to spontaneously resolve within 6 months, this results in considerable distress in the family of the newborn. Bedside vacuum suction is a safe and convenient method for treating neonatal skull depression.