Papile-Burstein classification

For periventricular-intraventricular hemorrhage

Papile et al., performed brain scanning by computed tomography on 46 consecutive live-born infants whose birth weights were less than 1,500 gm; 20 of them had evidence of cerebral intraventricular hemorrhage. Nine of the 29 infants who survived had IVH. Four grades of IVH were identified. Grade I and II lesions resolved spontaneously, but there was prominence of the interhemispheric fissure on CT of the infants at six months of age. Hydrocephalus developed in infants with Grade III and IV lesions. Seven of the surviving infants with IVH did not have clinical evidence of hemorrhage. There were no significant differences between the infants with and without IVH in birth weight, gestational age, one- and five-minute Apgar scores, or the need for resuscitation at birth or for subsequent respiratory assistance [1].

Grade 1

Small bleeding in the subependymal germinal matrix. Mortality 5%

Restricted to subependymal region / germinal matrix which is seen in the caudothalamic groove overall good prognosis.

Grade 2

Extension of blood in < 50% of the ventricular system. Mortality 10%

Overall good prognosis

Grade 3

Extension of blood in > 50% of the ventricular system. Mortality 20%.

Grade 4

Grade 3 with parenchymal haemorrhage 90% mortality

It should be noted that it is now thought that grade IV bleeds are not simply extensions of germinal matrix haemorrhage into adjacent brain, but rather represent sequelae of venous infarction.

Periventricular venous infarction that occurs with obstruction of blood flow through the terminal vein of the periventricular region.

References

1)
Papile LA, Burstein J, Burstein R, Koffler H. Incidence and evolution of subependymal and intraventricular hemorrhage: a study of infants with birth weights less than 1,500 gm. J Pediatr. 1978 Apr;92(4):529-34. PubMed PMID: 305471.