

## *Brief Report of Special Case* **Contralateral frontal and cerebellar haemorrhages after peri-insular hemispherotomy**

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### **Introduction**

Distant postoperative parenchymal haemorrhages [5] have never been described as a complication of peri-insular hemispherotomy. We report a case who developed contralateral haemorrhages and propose a mechanism underlying this phenomenon.

### **Case report**

A 8 years-old boy with intractable epilepsy, following a peri-natal left Sylvian infarction underwent a left peri-insular hemispherotomy.

The child was operated on in the supine position with the head turned to the right [7]. Surgery was performed without complications, but with aspiration of a significant amount of CSF while opening the porencephalic cyst. The patient recovered from the anaesthetic with no new neurological deficits. A drain was left in the subgaleal space.

One day later, he developed progressive stupor, arterial hypertension and bradycardia. The drain had collected 430 ml over time, with 200 ml in the hour preceding the clinical deterioration. A cerebral MRI revealed contralateral frontal, parietal and cerebellar intraparenchymal haemorrhages with bilateral subarachnoid supra-cerebellar bleeding (Fig. 1). An important brain shift from right to left was observed. No venous or arterial abnormalities could be found on the angiographic sequences.

The child was managed with sedation and intracranial pressure monitoring, the drain was removed and his head was turned to the right. Two days later, before extubation, a control cerebral CT-scan revealed re-expansion of the porencephalic cyst and decrease of brain shift. He showed no additional neurological deficit and has been seizure-free for 25 months after the operation.

### **Discussion**

Cases of distant intraparenchymal haemorrhage have been associated with supratentorial ablative surgery for epilepsy, vascular or tumoral lesions [2, 4–6] but never been reported in peri-insular hemispherotomy [7].

In our case, the severe hemispheric atrophy and the large amount of CSF aspirated preoperatively could mimic the situation of an ablative procedure, facilitating the displacement of remote brain. The amount of postoperative CSF drained appears to be an important factor.

Several authors [1, 5] relate distant intraparenchymal haemorrhages to the amount of cerebrospinal fluid (CSF) leakage, but their hypothesis could not be clearly documented. In our case, we could record the presence of brain displacement and prove in the absence of visible mass effect on the postoperative CT and MR, as well as with low initial values of ICP, that CSF overdrainage was the only factor involved in contralateral brain shift.

The precise mechanism leading to the haemorrhage in the presence of brain shift is still not well understood. Stretching or tearing of bridging cortical veins or superior vermian veins and their tributaries has been suggested by several authors [6]. A critical increase in the transmural pressure of the respective draining veins could also be involved, as reported by Konig [5]. This could explain the presence of blood in the subarachnoid space, as observed in our case and previously reported [6]. Our case illustrates and supports the hypothesis put

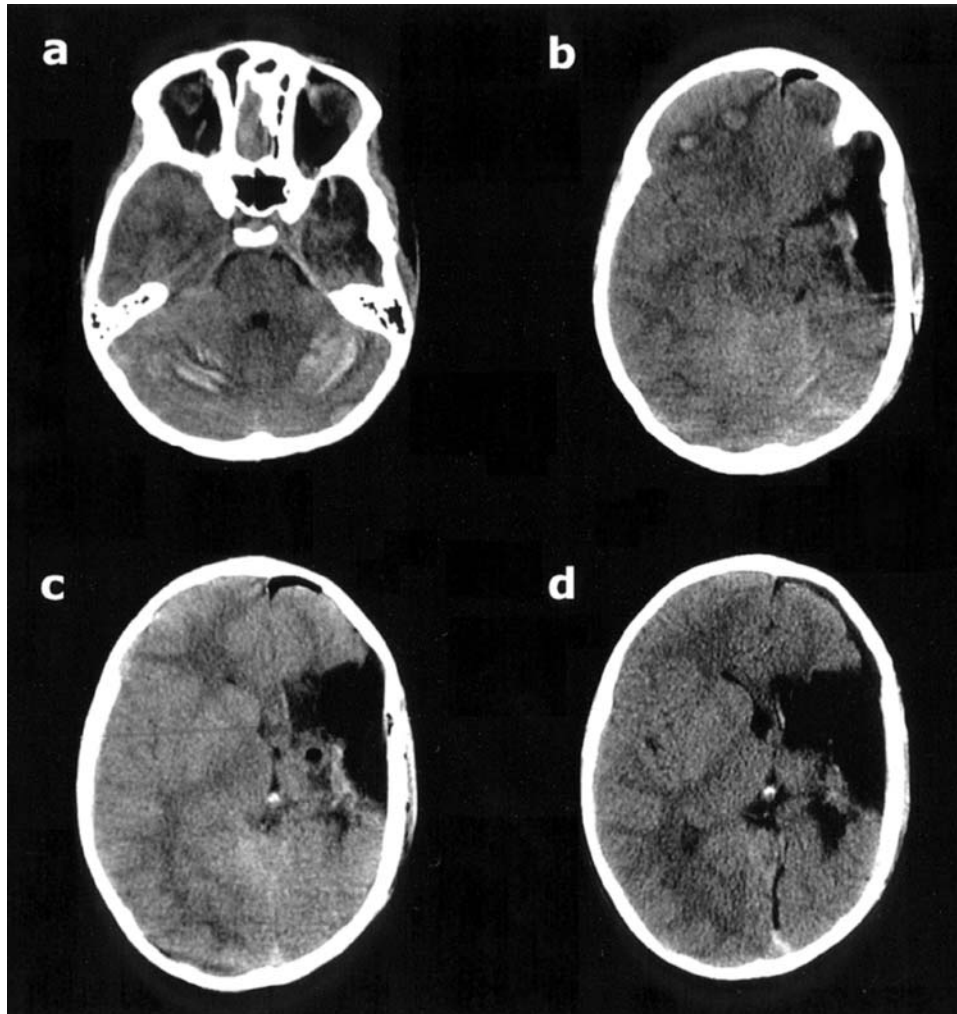


Fig. 1. Post-operative TDM: (a, b, c) Appearance of 3 contralateral supratentorial and cerebellar hemorrhages with subarachnoid blood. (d) Re-expansion of the porencephalic cavity and decrease of brain shift

forward previously by other surgeons that CSF hyperdrainage is a cause of distant haemorrhage.

### Conclusion

In peri-insular hemispherotomy, CSF overdrainage can result in contralateral brain shift in hemi-atrophic brain patients without any increase in ICP, and lead to distant intraparenchymal haemorrhage. Avoidance of such complications might be achieved by careful monitoring of the CSF draining system.

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