ROYAL
HOSPITALS

THE ROYAL BELFAST HOSPITAL FOR SICK CHILDREN

30th November, 1995

Dr. G. Murnaghan,
Director of Medical Administration,
King Edward Building,
RVH.

Dear Dr. Murnaghan,

re: **Adam Strain D.O.B. 4.8.91 - Hosp No. 364377**

On the 27th November 1995 at 06.45 am I was the Consultant Paediatric Anaesthetist on duty for the Royal Belfast Hospital for Sick Children. I commenced a general anaesthetic for a kidney transplant on a 4 year old boy known to me as Adam Strain. He was in polyuric renal failure as the result of congenital posterior urethral valves and had been receiving continuous peritoneal dialysis. He had been admitted to RBHSC on Sunday 26th Nov 1995 in preparation for the transplant. I was made aware of the preoperative problems of fluid administration, that he usually received night feeds and that iv fluids could not be given 2 hours prior to surgery so I had permitted clear gastric fluids to be given up to the last possible moment. I encountered no difficulties following his arrival in theatre accompanied by his mother.

He weighed 20 kgs. General anaesthesia was induced uneventfully using thiopentone 125 mg, atropine 0.3 mg and atracurium 10 mg given by a 25G butterfly needle in his right antecubital fossa with his mother cuddling him. I.v. access, arterial access and a central venous catheter were all placed without undue difficulty and a lumbar epidural was sited under sterile technique to provide pain relief during and after the procedure.

I administered iv fluids as is usual, and calculated to correct his fluid deficit, supply his maintenance, and replace operative losses. Crystalloid fluids (500 ml bags of 0.18 NaCl in 4% glucose x 3, and Hartmanns 500 mls over 4 hours) were continued to provide maintenance and supply sufficient fluid for the native polyuric kidneys. As there was a substantial ongoing blood loss from the surgery colloid fluids (HPPF) and eventually packed red blood cells were given. His haemoglobin at the start of the procedure was 10.5 g/dl and fell to an estimated 6.1 g/dl during the case and was 10 g/dl at the end. The nurses were asked to weigh blood soaked swabs during

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the case so that they could be more correctly assessed. There was 328 mls of blood loss in the swabs, 500 mls of blood in the suction bottle and a unknown amount in the towels and drapes. I estimated this to be about 300 mls but they were heavily soaked. Thus the total blood loss I estimated to be 1128 mls. The replacement for this included 2 packed cells (180-250 mls each) and 1000 mls of HPPF. The infusion of fluids was titrated against the CVP and BP to ensure that the blood volume was more than adequate to permit maximum perfusion of the donor kidney. This process was complicated by the fact that the donor kidney did not appear well perfused after an initial period of apparently good kidney perfusion.

A low dose dopamine infusion had been commenced near the start of the case to improve the blood flow of the donor organ. The pulse rate, CVP and arterial blood pressure gave me no cause for concern throughout the case, and a blood gas at 09.30 am confirmed good oxygenation and no sign of acidosis or any indication of problems. In view of the CVP, heart rate and BP I did not consider the fliuds to be either excessive or restrictive. Indeed I regarded the fluids to be appropriate and discussed this with other doctors present in the theatre.

At the end of the case I reversed the neuromuscular block with neostigmine and anticipated the child awakening. When there was no sign of this I examined his pupils and found them to be fixed and dilated. I became extremely concerned that he had suffered brain stem injury so I transferred him to the PICU for further ventilation of his lungs and assessment. In the PICU hyperventilation and mannitol was administered and iv fluids restricted to permit fluid to be drawn out of the oedematous spaces. Along with Dr Savage I spoke to Adams' mother and offered my sympathy for the loss of her child but could not supply her with a clear explanation of what had happened to Adam.

I accompanied Adam to the CT-scan room later on that day and was informed by the neuro-radiologist that he had gross cerebral oedema and herniation of his brain.

I remain extremely perplexed and concerned that this happened to Adam and cannot offer a physiological explanation for such severe pulmonary and cerebral oedema in the presence of normal monitoring signs.

Yours sincerely,

R.H. Taylor, MB, FFARCSI.,
Consultant Paediatric Anaesthetist.

c.c. Dr. M. Savage, Consultant Nephrologist, RBHSC
Dr. J. Gaston, Clinical Director ATICS,RVH