The use of splenic artery embolization as a bridge to safe laparoscopic splenectomy in a patient with resistant immune thrombocytopenic purpura

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Dear Editor,

Immune thrombocytopenic purpura (ITP) is an autoimmune disorder characterized by a low platelet count caused by destruction of antibody-sensitized platelets in the reticuloendothelial system, such as the spleen [1]. Overall, the key element is the loss of self-tolerance, leading to the production of autoantibodies directed against platelet antigens. In children with ITP, the clinically important subgroup is those who have platelet counts less than or equal to $20x10^9$ /L and require ongoing platelet-enhancing therapy because of bleeding symptoms. In these patients, second-line therapies are indicated. Laparoscopic splenectomy has now been accepted as an effective treatment with minimal risk of serious complications in expert hands.

Rarely, ITP can be complicated by intracranial haemorrhage and this usually occurs in the setting of extremely low platelet counts of $<10 \times 10^9$ /L [2]. Although rare, it is associated with mortality rates of approximately 50%, while among the survivors, neurological deficits are common. Emergent splenectomy can result in immediate improvement in platelet counts in approximately 80% of patients [3]. Nevertheless this procedure carries the risk of perioperative bleeding, and especially in haemodynamically unstable patients. Here, we present the successful use of splenic artery embolization as a temporizing measure prior to laparoscopic splenectomy in a patient with chemo-resistant ITP and presented with intracranial haemorrhage.

A 12-year old boy with a previous history of diffuse large B–cell lymphoma in remission first presented with a 2-month history of increased generalised petechiae and gum bleeding. He was diagnosed with immune thrombocytopenic purpura after laboratory investigations. However, treatment with prednisolone, cyclosporine, intravenous

immunoglobulins and rituximab all failed to increase his platelet count. Subsequently, he was admitted as an emergency with sudden onset of frontal headache and altered consciousness. Physical examination showed a reduced Glasgow Coma Score of 12/15, right upper limb weakness, signs of meningeal irritation and aphasia. Computed tomography of the brain showed a crescent rim of extra-axial collection causing mild inward displacement of the cerebral hemisphere over the left frontal and temporo-parietal region, suggesting subacute haematoma (figure 1). Platelet count at admission was 7 x 10^9 / L.

In view of the serious nature of his symptoms and the very low platelet count, we decided to proceed with splenic artery embolisation on the day of admission with a combination of stainless steel coils and polyvinyl alcohol particles (figure 2). His platelet count rose rapidly the following day to above 100 x 10^9 /L. Laparoscopic splenectomy was performed 2 days later with no complications. No blood products were transfused intra or peri-operatively. Platelet count continued to rise to 226 x 10^9 /L two days after the operation. He made a full neurological recovery and was discharged 7 days after his operation. At last review, his platelet count was 380 x 10^9 /L and he was taken off all medication.

In patients with acute immune thrombocytopenic purpura, splenectomy is indicated in those with bleeding symptoms with platelet counts of less than 20 x 10^9 /L [4]. Laparoscopic splenectomy is currently the preferred method for the surgical management of haematologically-related splenic disorders as it has been shown to result in faster recovery periods and reduced postoperative pain [5]. However, haemorrhagic complications remain a concern for this procedure given the spleen's rich vascularity and

maneuvers required for the operation [6,7]. The risk of such events occurring may be increased in patients with very low platelet counts. Splenic artery embolisation has previously been used to treat various conditions, which include chronic immune thrombocytopenic purpura, hereditary spherocytosis, splenic trauma in haemodynamically unstable patients, and also in patients with liver cirrhosis with hypersplenism [8-11]. It has been demonstrated to result in significantly reduced blood loss during subsequent laparoscopic splenectomy compared to patients who received laparoscopic splenectomy as a sole treatment [12]. In our patient, we carried out complete splenic artery embolisation in an acute setting, with splenectomy in a staged fashion, with both procedures yielding a considerable improvement in platelet count. The rationale for performing complete embolisation was because of the unlikelihood of success for partial embolisation in our patient, due to the refractory nature of his disease. Splenectomy after embolisation is required to reduce the chances of developing post infarction syndrome (fever, left upper quadrant pain, risk of infection and abscess formation). Other potential complications associated with embolisation are related to migration or inappropriate placement of embolic material. Although it has recently been suggested that splenic artery embolisation preceeding laparoscopic splenectomy should not be carried out routinely as appropriate use of blood products and correct surgical technique will be adequate in controlling blood loss [13], in this patient, an extremely low platelet count and intracranial bleeding necessitated immediate intervention. As emergent splenectomy had a significantly higher risk of haemorrhagic complications, splenic artery embolisation could provide a temporary bridge before splenectomy. We therefore propose that in the treatment of children with life threatening acute immune thrombocytopenic purpura,

splenic artery embolisation preceeding laparoscopic splenectomy may be a viable method of stabilision.

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Figure legends

Figure 1 - An axial computed tomography of the brain showing intracranial haemorrhage in the left parietal/occipital area (arrow).

Figure 2 - A fluoroscopic image taken after splenic artery embolisation with coils. The celiac artery is highlighted with contrast.

Fig 1

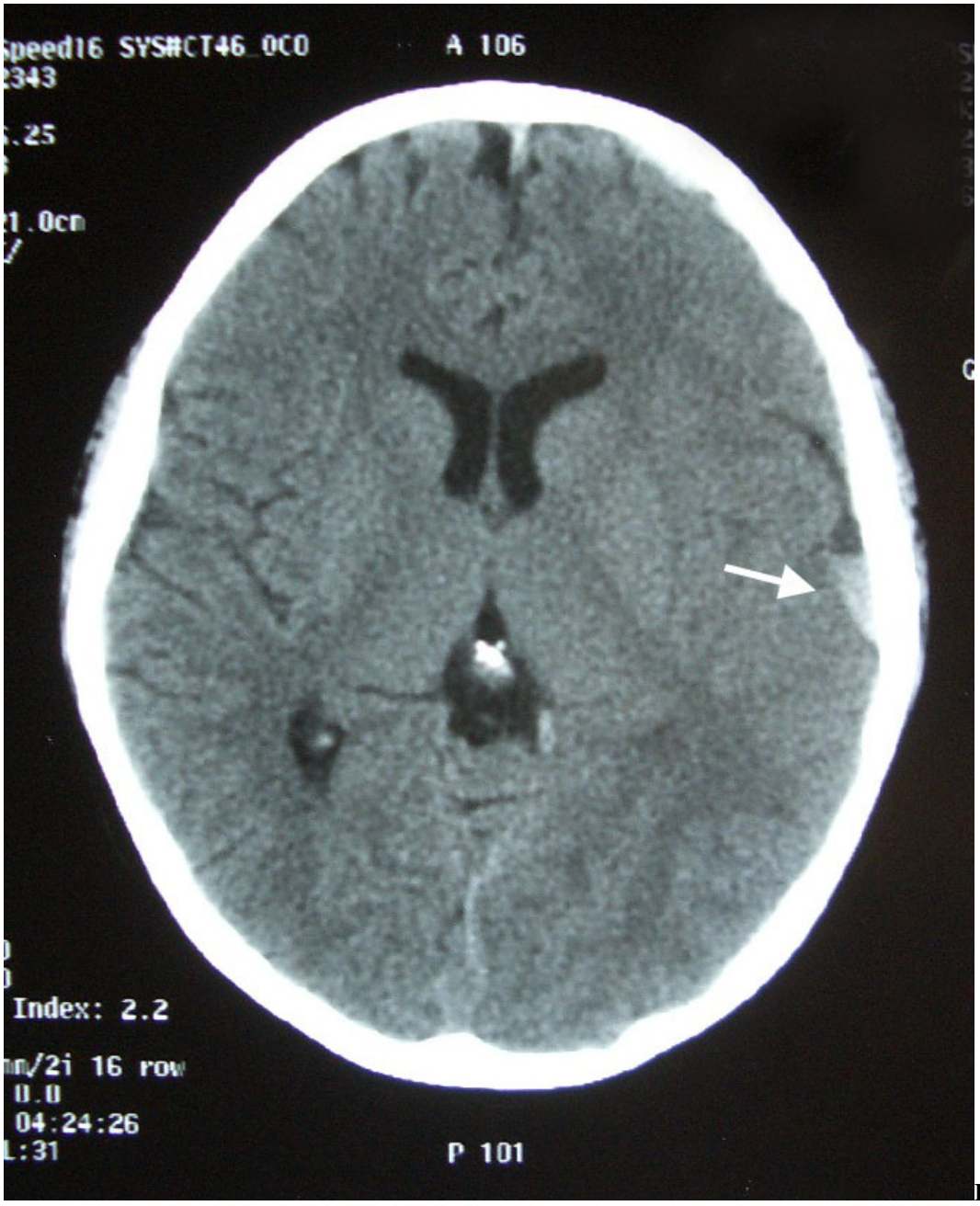

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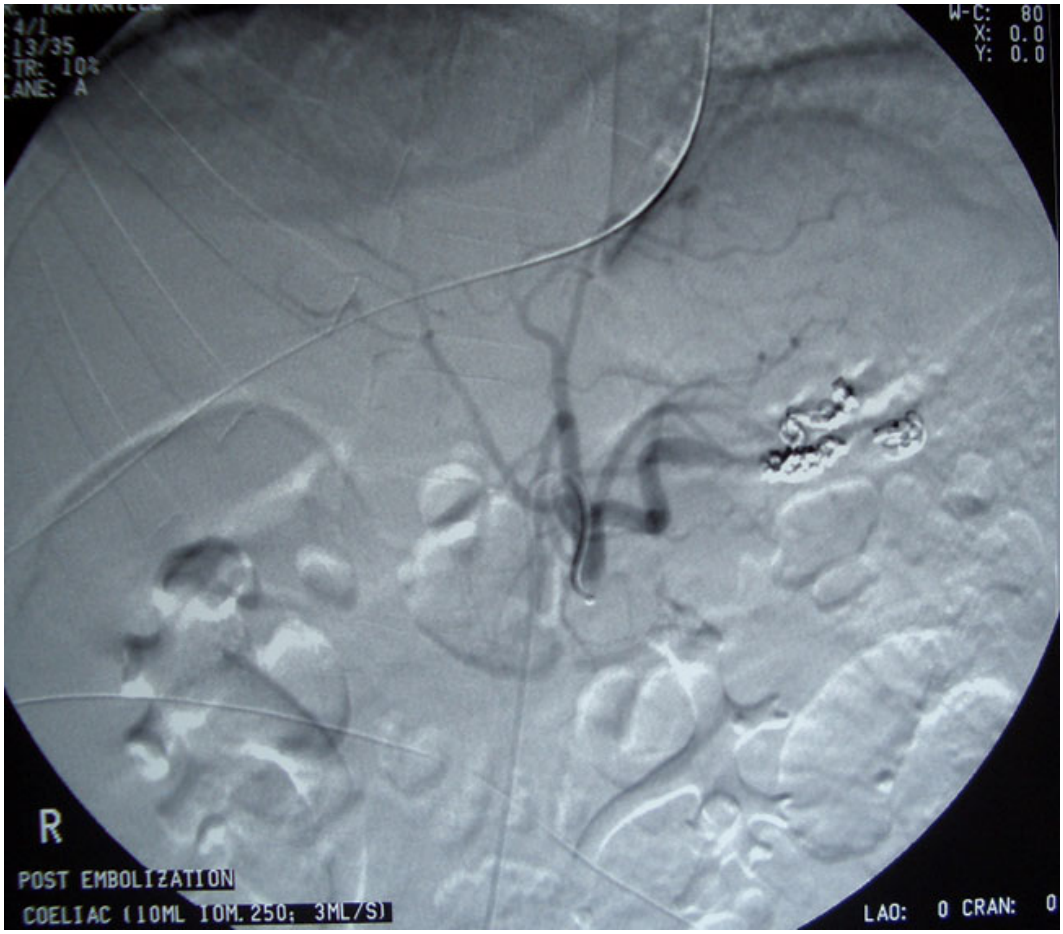
Fig 2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