

Gauze Packing And Planned Reoperation For Splenic Trauma In The Presence Of Coagulopathy

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Abstract

Although gauze packing and planned reoperation has been documented for the treatment of liver trauma, it has not been described for the management of the ruptured spleen. We document a single case of a grade I splenic injury, which occurred during an emergency subtotal colectomy for a massive lower gastrointestinal bleed. The options of suturing and packing with absorbable mesh failed in the presence of a severe coagulopathy and it became necessary to perform perisplenic packing with large gauze swabs with planned reoperation resulting in a favourable outcome and splenic conservation.

INTRODUCTION

Splenectomy remains the standard treatment for uncontrollable splenic haemorrhage ¹ with many techniques of splenic conservation recommended, including suturing, wrapping with mesh and oxidized cellulose, partial splenectomy as well as splenectomy and reimplantation of tissue ^{2,3,4,5,6}. However none of these is appropriate in severe coagulopathy, since any suturing causes bleeding and splenic mobilisation leaves a raw retroperitoneal surface that is likely to continue oozing.

CASE REPORT

A 50-year old man developed sudden, massive rectal bleeding. He transiently responded to fluid resuscitation, and was subsequently transfused with whole blood, fresh frozen plasma (FFP) and cryoprecipitate. Colonoscopy and arteriography failed to demonstrate a specific site of haemorrhage. Since he was hemodynamically unstable and had developed a coagulopathy due to the massive haemorrhage, an emergency laparotomy was undertaken to perform a subtotal colectomy. At surgery, there was widespread diverticulosis throughout the colon with some surrounding adhesions. In mobilising the splenic flexure, a 1 cm splenic laceration occurred, which began to bleed steadily. At this point an attempt was made at suturing with 3.0 chromic catgut, then light packing with an

absorbable mesh. Both procedures failed and the attempt at suturing actually made the bleeding worse. The spleen was then packed with abdominal gauze swabs and the subtotal colectomy successfully completed.

On removal of the gauze, the spleen was noted to be persistently oozing with much surrounding blood. Digital pressure for 10 minutes stopped the ooze only during compression, but resumed immediately on release. The patient's hemoglobin was now 2g/dl and he was oozing from many sites; it was decided that mobilisation of the spleen and splenectomy could cause further uncontrollable oozing. Four large laparotomy swabs were then packed tightly around the spleen to produce compression of the capsular tear. The abdomen was closed and the patient managed in the high dependency unit. He was resuscitated with 5 units of whole blood, FFP and cryoprecipitate postoperatively and a *planned reoperation* was then performed 48 hours later to remove the gauze swabs after the patient was stabilised and the coagulopathy corrected. There was no bleeding from the spleen at this time and the patient made a full recovery.

DISCUSSION

The spleen is the abdominal organ most commonly injured by blunt trauma. Injuries vary from a small subcapsular tear to hilar devascularization or a shattered spleen, but are rarely fatal with good medical care 1.

Approximately 20% of splenic injuries are iatrogenic in abdominal procedures 2 and immediate splenectomy is indicated in patients with severe multiple injuries, splenic avulsion, fragmentation, rupture, extensive hilar injuries, failure of hemostasis, peritoneal contamination from gastrointestinal injury or rupture of a diseased spleen 1. *Packing with gauze* and *planned re-operation with splenic conservation* has not been described as an option for uncontrolled splenic haemorrhage though it is well documented as a successful technique for hepatic trauma.

This is reported in many series such as hepatic trauma with a pre-existing coagulopathy in *Hollands et al* series in 1989 where 25 out of 197 cases were packed with 1 death ⁷ and *Caruso et al* in 1999 where 129 case were packed out of 804 cases; 69 survived and a

planned re-operation was performed in 36 to 72 hours⁸. In particular, packing with gauze swabs is useful in the presence of a coagulopathy and a large surface area of injury⁹.

A search of the literature reveals minimal information on splenic packing as an option when all else fails in the presence of a coagulopathy. However, packing with oxidized cellulose, mesh or omentum have been the trends as seen by the work on successful packing with oxidized cellulose or omentum in 27 out of 37 cases in a series of 127 cases by *Chadwick et al* 3 and by *Lange in 1988* where a 67% (22 out of 33) salvage rate was achieved.

The mesh was applied in such a fashion to act as a matrix to promote clotting and is advocated for those with bleeding from a large surface area, from deep parenchymal injuries or those extending into the hilum 4. However, this requires splenic mobilisation, which can produce oozing in the midst of coagulopathy. Splenorrhaphy is also a possibility as seen as a viable option for the injured spleen with a grade I or II injury as seen in a series by *Kreis et al* in 1987 where there were 85 cases of splenic trauma, with splenectomy performed in 43 and splenorrhaphy in 42.; 3 in the splenorrhaphy group died 5.

In 1982 *Millikan et al* advocated repair, partial resection and reimplantation of splenic tissue to avoid postsplenectomy sepsis where splenectomy must be done 6. The general trend of management is towards splenic conservation since splenectomy involves complications such as overwhelming sepsis by encapsulated organisms, such as pneumococcus, meningococcus and haemophilus can occur early or late (even years in 2% of individuals and in particular with children and young adults 1. In particular, many of these techniques of repair or wrapping involve either mobilisation or wrapping of the spleen, which are not good options in a coagulopathy, where bleeding is likely to occur from any divided or raw surface.

We document this case of a grade I splenic injury, which occurred during an emergency subtotal colectomy for a massive lower gastrointestinal bleed with a pre-existing coagulopathy. The options of suturing and packing with absorbable mesh failed and the

spleen was pressure packed with 4 large laparotomy gauze swabs to achieve hemostasis. A planned re-operation was undertaken 2 days later when the coagulopathy was corrected.

This case illustrates a relatively well-documented technique for liver trauma applied successfully to splenic injury in the presence of coagulopathy for control of life-threatening haemorrhage in splenic trauma since the options of using absorbable mesh, oxidized cellulose, omentum, splenorrhaphy or even splenectomy (due to a raw oozing area) may fail in circumstances where the surface area injured is large and a coagulopathy exists.

We hope our fellow surgeons who may find themselves in such situations consider of this option and use it more liberally in the hope of reducing mortality and morbidity rates by the avoidance of splenectomy in cases of severe coagulopathy where other techniques may be hazardous.

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