

Title:	Combined use of fluoroscopically guided fibrin sealant and removable metallic stent for oesophageal leak/perforations
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Background:	<p>Fibrin sealants are used in a wide range of surgical procedures, its primary function is a haemostatic agent, but also assists tissue sealing and wound healing. Tisseel (Immuno, Toronto, Ontario, Canada) is a fibrin sealant that works through the formation of a fibrin gel, by combining fibrinogen and other plasma proteins with thrombin under controlled conditions.</p> <p>Endoscopic placement of fibrin sealant has proved successful in the treatment of oesophageal leaks, perforations and fistulas. Tissue sealant has been used successfully in a case of persistent oesophago-bronchial fistula secondary to spontaneous rupture of the oesophagus (Boerhaave's syndrome) with endoscopic placement of fibrin. To our knowledge, it has not been described without endoscopy.</p> <p>We present our experience using fluoroscopically guided fibrin sealant injection combined with stent placement for oesophageal perforation/leaks.</p>
Methods:	<p>We present four cases of oesophageal leaks/perforations treated by injection of fibrin-glue sealant and covered stent.</p> <p>The patient is positioned in a left lateral position and is sedated. A 5F KMP catheter with a short angled tip is passed per oral and the site of leak is identified with injection of non-ionic contrast. Under fluoroscopic control, the neck of the leak is entered with hydrophilic coated wire with catheter guidance (75 cm 5F KMP, Cook, Bloomington, Ind).</p> <p>The catheter is advanced over the wire through the neck. On slow withdrawal of the catheter, the fibrin-glue is hand injected to plug the tract at approximately around 1ml/sec. A total of 10ml (5/5ml) of fibrin glue is injected. Following this injection, some of the sealant sets within the catheter and so this catheter is then removed and another catheter is inserted. Using further contrast through this catheter, a check is made for assessment of closure of leak.</p> <p>A removable covered metallic stent SX-ELLA HV oesophageal stent (ELLA-CS. Company, Hradec Kralove, Czech Republic) is then inserted over a guidewire to cover the leak site. The patient returns the following day for a repeat water soluble contrast swallow to check for any remaining leak. The patient is then allowed oral feed.</p> <p>The stent is subsequently removed via an endoscope after six to eight weeks.</p>

Results:

Following fibrin-glue injection, 3 of 4 cases showed complete occlusion of track, with no contrast passing through the leak on subsequent contrast study. One patient who had a > 2cm neck to the leak required two treatments using the same method before the leak was successfully treated.

All four patients were re-commenced on oral feeds and made a good recovery and the stents were removed between 6 and 8 weeks.

From our work several technical issues have arisen. The double lumen catheter which is used to keep the components of Tisseel separate to avoid setting of the fibrin-glue within the catheter, does not allow for passage of a guide wire. Hence we injected the sealant down the 75 cm 5F KMP catheter (Cook, Bloomington, Ind). 10ml of solution was successfully injected before the sealant set within the catheter.

The problem of radiographic visualisation of injected fibrin glue has been addressed previously with barium impregnated fibrin sealant to close fistulas in interventional radiologic procedures described in 1993. However, this has not become part of routine practice because of the possible risk of infection. Non-visualisation of fibrin glue on fluoroscopy is a limitation of the technique.

Conclusions:

Our experience suggests oesophageal leaks/perforations may be sealed fluoroscopically without endoscopy or surgical thoracotomy using tissue sealant and stenting. The technique shows promise though there are technical challenges as the kit is designed to allow delivery of the sealant through an endoscope under direct vision. Also, a larger study would be required to demonstrate a significant additional benefit from stenting alone.

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