ASPECTS OF TREATMENT*

Oesophageal varices: evaluation of injection sclerotherapy without general anaesthesia using the flexible fibreoptic gastroscope

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Summary

A technique of injecting oesophageal varices through a flexible fibreoptic gastroscope is described and its value in controlling haemorrhage and eradicating varices in 34 patients is considered prospectively. Twenty-five per cent of the patients re-bled during the first emergency admission after injections, but control was achieved in all. Subsequent re-bleeding occurred in 46% and varices were ultimately eradicated in 59%. It is concluded that the procedure is associated with fewer serious complications compared with rigid oesophagoscopic techniques and may be as effective.

Introduction

Injection sclerotherapy for oesophageal varices is now established both in controlling the emergency of haemorrhage and in elective ablation (1–6). Various techniques have been developed and the largest experience is with the use of a rigid Negus oesophagoscope. This technique is advocated because the view down the wide lumen is unlikely to be obscured by blood and also because the instrument can be manipulated to provide local pressure and help occlude the varices after injection (1–7). The procedure carries an appreciable risk of perforation as well as occasional difficulty in intubation (1,4,6,8), although Williams and Dawson (8) claim to have overcome this problem by using a wide sheath advanced over a flexible gastroscope ('Williams' technique); nevertheless, their technique still requires general anaesthesia with its attendant hazards in such seriously ill patients. Of these, severe pulmonary complications are particularly common (4), but they may in part be related to the Sengstaken–Blakemore tubes (9) which are often used after injection (3,4,7,8).

Considering that the avoidance of general anaesthesia would be a distinct advantage to the patient, we have investigated the effectiveness of an injection technique carried out under local anaesthesia using the flexible fibrescope alone. The technique is described and a prospective analysis of our first 3 years' experience is presented.

Technique

Our technique was developed from our long-standing use, since the 1940s, of the 'St James' single balloon tube which is now marketed as the Sengstaken–Blakemore (S–B) tube Model K. With other commonly used models which incorporate an oesophageal balloon it is likely that the balloon will need to be enormously inflated to a size not tolerated by the conscious patient in order to exert any effective pressure on the varices (10). It is the pressure exerted by traction on the gastric balloon and the resulting compression of the varices distal to the cardia against the diaphragm that reduces or interrupts the flow in these varices and leads to cessation of bleeding from above and may facilitate thrombosis after injection.

Initially injections were carried out in the X-ray department under screening control, using 45% Conray (iothalamic acid) as the first injection at each site to ascertain whether the injection was intravariceal or interstitial. More than 75% were seen to be intravariceal. An important observation on which the technique hinges was that with traction on the gastric balloon the injected contrast medium could be seen to pool within the varix and move along it only very slowly, whereas without traction the medium streamed away so rapidly that the chance of affecting the vascular endothelium or promoting

local clotting would appear remote. Huge varices often collapse on firm traction being applied to the gastric balloon, and in practice it is often necessary to release the traction for a few moments so that the varices pout sufficiently to allow intravariceal insertion of the needle; with the needle in situ traction is reapplied.

Patients presenting with bleeding are first resuscitated and submitted to early diagnostic fibreoptic endoscopy. Variceal haemorrhage, once confirmed, is then controlled with an S–B K tube. The patient is nursed under constant supervision in the semiprone head-down position. A standard liver failure regimen is instituted with enemas and infusions of magnesium sulphate and neomycin and lactulose given down the gastric lumen of the S–B tube. Injection treatment is then usually performed as a planned procedure the following day, when the patient's condition has stabilised and the gullet no longer contains blood obscuring the view. In elective cases also an S–B K tube is used.

One unit of fresh frozen plasma is given immediately before injection and another during it. Ethanolamine oleate, warmed to make it less viscous, is drawn up into several 1-ml insulin syringes; greater pressure may be applied by these syringes to overcome the flow resistance of the fine needles. Sclerosants such as STD (sodium tetradecyl sulphate) which are used for varicose veins should not be given because extravasation, as we have seen on 3 previous occasions, can cause severe local tissue necrosis.

A calm and reassuring atmosphere is necessary and a well-rehearsed and competent team is important in order to receive maximum co-operation from the patient. The patient's throat is sprayed with local anaesthetic and 10 ml of liquid glycerine swallowed. Sedation is provided by intravenous diazepam, and rarely more than 5 mg is required. Then the patient is placed in the semiprone position with head-down tilt.

The balloon is inflated and slight traction maintained on the S–B tube throughout. An end-viewing GIF D2 Olympus endoscope is gently passed under direct vision and a flexible retractable Olympus NM-3 needle passed down the biopsy channel of the endoscope with the aim of injecting individual columns of varices at three different levels, beginning at the oesophagogastric mucosal junction and working upwards. Usually 4 ml is injected into each site and a total of 30 ml may be used. Slight bleeding is common, but the partially obscured view rarely prevents injection of the main varices. If entry to a varix is difficult momentary release of traction will allow it to pout and permit easy placing of the needle. Traction

should then be continued so as to reduce flow and facilitate sclerosis.

The patient is subsequently transferred to the ward and kept in the semiprone position, traction on the S–B tube continuing to be maintained. The following day traction is released and, if haemostasis is maintained, the balloon later deflated and the tube removed. At a convenient time within the next week the oesophagus is inspected in a similar manner and further injections given if necessary. In most bleeding cases 2 injections are usually required, but up to 4 may occasionally be needed. Recurrences usually require only 1 injection. Follow-up consists of standard outpatient endoscopic inspection at 3–6-month intervals.

Grading of varices following injection

A system of grading varices was devised for the purpose of this study. Varices were thus considered to be:

'Failed' if more than one major column remained.

'Partially eradicated' if only a single major column remained or if all the columns were very much smaller.

'Almost completely eradicated' if only tiny remnants or recurrences remained.

'Completely eradicated' if no traces of varices were seen.

Patients

Thirty-four consecutive patients with oesophageal varices admitted to the gastroenterological surgical unit at St James's Hospital, Balham, between 1976 and 1981 have been treated by injection sclerotherapy and followed prospectively. Twenty-six were admitted as emergencies with haemorrhage occurring within 1 week of starting injection treatment, while 6 who had had haemorrhage within the previous 4 weeks and 2 who had had no previous haemorrhage were submitted for elective treatment. The mean follow-up period was 28 months with a range of 4–60 months. Twelve patients were followed up for more than 2 years. The mean age was 57 (range 16–81) years. There were twice as many males as females. The underlying pathology was equally divided between alcoholic cirrhosis, portal vein obstruction, and cryptogenic cirrhosis. Severity of liver disease was graded A, B, or C, using a modified risk grade of Child and a numerical scoring system from Pugh et al. (11). Encephalopathy was scored numerically according to Parsons-Smith et al. (12). There were 17 A-, 8 B-, and 9 C-graded patients.

Coexisting lesions were detected endoscopically in 20 patients as follows:
Oesophagitis, 15.

Duodenal ulcer, 7.
Duodenal and gastric ulcer, 1.
Duodenal erosions, 1.
None of these lesions was considered to be the main source of haemorrhage as bleeding was seen to be coming from the varices.

Deaths

There were 8 deaths, all in patients presenting with acute bleeding. The cause of death, grade of liver disease, and survival times of these patients are shown in the table. There were no deaths in the first 4 months following presentation, and the median survival time was 13 months. Haemorrhage was the main cause of death in only 1 patient, but the occurrence of haemorrhage following injections was a poor prognostic indicator in that half of these patients later died. Patients with Grade-C liver disease featured prominently among those who died and liver failure accounted for or contributed to 6 out of the 8 deaths.

Causes of 8 deaths among 34 patients treated by injection sclerotherapy

No	Causes	Risk group	Survival time (months)
3	Liver failure	C	4
		C	14
		C	6
1	Haemorrhage	A	12
1	Surgery/liver failure/ bronchopneumonia	C	8
1	Renal failure	C	4
2	Bronchopneumonia/liver failure	A	48
		C	13

Recurrence of haemorrhage

Haemorrhage recurred following injection treatment within the first admission in 5 out of the 26 patients admitted as emergencies, but control by further injections was effective in all cases. Of the total of 32 patients receiving elective or emergency injections for haemorrhage 15 (47%) had bleeding episodes requiring further admission and transfusion. One patient had 6 episodes and died 8 months after presentation. In these patients re-bleeding occurred within 12 months at a mean interval of 4 months from the first injection. Further emergency surgery was performed on 2 patients. One underwent portoazygos disconnection and high gastric transection for continuing haemorrhage, while the other required

laparotomy for active chronic hepatitis which presented with signs suggesting generalised peritonitis. Both died.

Number of injections

A total of 214 injections were performed in 34 patients, an average of 6.3 per patient. Of the 12 patients followed up for more than 2 years, each has received on average 11 injections over a mean of 32 months. One patient has received 24 injections in 5 years, during which he has had 2 recurrent haemorrhages. His varices have remained in the 'almost completely eradicated' stage, reverting occasionally to the 'partially eradicated' state.

Eradication of varices

In only 4 patients was eradication of varices 'complete' within 6 weeks and both required 2 separate injections. The most common stage at 6 weeks was 'partial eradication', while the eventual outcome was as follows:

Complete eradication, 12.
Almost complete, 8.
Partial eradication, 6.
Failure, 8.

The group classed as 'failures' received on average 8 injections over a mean of 6 months, while 3 injections over a mean of 7 months were required in the 'completely eradicated' group. Recurrences which occurred in 'partially eradicated' or 'completely eradicated' varices were usually easy to control and reverted to their previous state with a single injection. The finding of 'partial eradication' at 6 weeks did not appear to confer greater protection from re-bleeding compared with those patients in whom injections had failed. Indeed in 1 patient re-bleeding occurred after 'complete eradication'. Re-bleeding was not related to the eventual outcome of attempts at eradication since it occurred in 3 patients whose varices were eventually 'completely eradicated'.

Patient tolerance and complications

While most patients found the procedure unpleasant, all but 2, who later complied, readily agreed to undergo further injections when necessary. On 3 occasions treatment was abandoned because of intolerance during the procedure but was later repeated successfully.

Transient oesophagitis was gross in 5 cases and mild in 3. Transient mediastinitis, characterised by severe thoracic pain, fever, and tachycardia, but without radiological change, occurred also in 2 cases. One patient developed a fibrous stricture which was dilated easily with Eder-Peustow bouginage.

Discussion

The effectiveness of injection techniques in controlling haemorrhage from oesophageal varices should first be compared with the use of an S–B tube alone. With the tube alone control of bleeding will be achieved in the majority of patients, but over half will re-bleed during the first admission and usually within 3 days of removal of the tube, and of these over 50% will die *(6, 9, 13)*. In a recently reported prospective controlled trial from King's College Hospital it was shown that both the risk of re-bleeding and survival were improved by sclerotherapy as compared with oesophageal tamponade alone *(6)*. There was a 25% incidence of re-bleeding during the first admission among our patients admitted as an emergency with haemorrhage and this is similar to that in other series in which a rigid technique has been used *(3, 4, 5, 14, 15)*. Patients who re-bleed during the first admission continue to represent a poor-risk group and, appreciating this, Sinnett *et al.* favoured early surgery instead of continued injections if the early response had been poor *(15)*.

Unfortunately, earlier reports give little information about bleeding which occurs after discharge from hospital. For instance, in one of the largest series Pacquet and Oberhammer claimed that 90% of patients were prevented from bleeding for 4 months after injection but gave no data about long-term control *(14)*. More recently, however, Terblanche *et al. (4)* and Sinnett *et al. (15)* have indicated that over half their patients subsequently re-bled. Thus the 46% incidence of further haemorrhage with our technique appears to compare favourably with that obtained by others. However, the King's College Hospital group report re-bleeding in only 33% of their patients and attribute this success to the 'Williams' technique *(6)*.

Just how effective each method is in the ultimate eradication of varices has only recently been considered. With each method varices may later recur, but when they do so they are usually easily obliterated. No matter which technique is used 3–4 injection sessions are usually required before eradication is complete. While the varices in 20 out of 34 (59%) of our patients were 'completely' or 'almost completely' eradicated, the rigid and 'Williams' techniques under general anaesthesia are claimed to eradicate most varices in surviving patients *(5, 6)*. True comparisons, however, cannot be made, particularly because in the Cape Town series *(5)* and the King's trial *(6)* there were several withdrawals because of either progressive deterioration in hepatic function and submission to liver transplantation or failure of management. It is of interest that while most of our 'complete failure' group died during 12 months, haemorrhage was the main cause of death in only 1 patient.

There is some doubt as to whether patients with varices which have not bled require treatment since the chance of bleeding is under 30% *(16)*. The high incidence of oesophagitis in the patients in the present study who presented with bleeding suggests that this may predispose to haemorrhage. It seems reasonable, therefore, that varices which have not bled should be inspected and submitted for injection if oesophagitis is found to be present.

In conclusion, endoscopic sclerotherapy is likely to remain an acceptable method of controlling and preventing haemorrhage from oesophageal varices. The flexible fibreoptic technique does not appear to be inferior to that with the rigid oesophagoscope in the control of bleeding, and the possible, but by no means proven, slight disadvantage in terms of ultimate eradication of varices may be more than compensated for by a reduction in complications, which are more likely to be associated with the rigid technique. Unfortunately there will always be a group of patients whose varices will be difficult to control, but if surgery is contemplated this will also be a high-risk group.

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