

# INJECTION SCLEROTHERAPY

Pages with reference to book, From 187 To 189

Huma Qureshi ( PMRC Research Centre, Jinnah Postgraduate Medical Centre, Karachi. )

Injection sclerotherapy for oesophageal varices was first reported from Sweden in 1939 using intravariceal quinine<sup>1</sup>. No recurrence of varices or rebleeding occurred till 3 years. Next year at Mayo Clinic, 2.5% sodium morrhuate was used for sclerotherapy resulting in reduction in the size of varices<sup>2</sup>. Longer follow up on a larger series of patients revealed that rebleeding was more frequent in those who had associated gastric varices<sup>3</sup> and therefore their presence was taken as a contraindication to the use of sclerotherapy.

The first experience of sclerotherapy from Great Britain was reported in 1949<sup>4</sup>; further follow up on these patients showed a better result of sclerotherapy if splenectomy was done prior to the procedure. The need to do follow up endoscopies to recognize the recurrence of varices was also brought to notice<sup>5</sup>. In 1959 sclerotherapy experience in 15 children below the age of 16 years was reported from Toronto<sup>6</sup>. A follow up till 4 years showed success in 9 cases. It was also experienced that bleeding episodes increased during upper respiratory tract infection in children and it was therefore recommended that children with varices should have adenotonsillectomy.

In 1960 instead of intravariceal injection, paravariceal injection was thought to be more effective because of the creation of submucosal fibrosis over the varix thereby protecting them from bleeding<sup>7</sup>. The technique was later picked up by others<sup>8,9</sup> who have collected enough data on its use in both elective and emergency sclerotherapy.

By 1973, surgeons at Kings College showed dissatisfaction with shunt and non-shunt procedures, especially in those with severe liver disease<sup>10</sup> while workers from Belfast<sup>11</sup> had published 93% success rate with sclerotherapy. Therefore, sclerotherapy was taken up by the Kings College too. Further modification in the ridged Negus oesophagoscope was made in 1975<sup>12</sup> allowing the varices to prolapse into the lumen of the scope, making the injection easier. High frequency of deaths due to oesophageal perforation (20%) reported from Kings College in 1977<sup>13</sup> prompted the development of a flexible outer sheath and endoscope plus needle<sup>14</sup>. By 1980, graduated flexible sheath was made commercially available.

Till almost 40 years after the first use of sclerotherapy no controlled data for the efficacy and improvement in the survival time following sclerotherapy was available. First few controlled trials were reported between 1979-1981<sup>15-17</sup> along with significant improvement in the survival time in one. Blood flow patterns in the oesophageal collaterals were demonstrated using endoscopic doppler<sup>18</sup>. Variations in the flow pattern were found to occur especially during respiration. Perforating veins connecting the varices to the paraoesophageal vessels were also seen throughout the whole length of the oesophagus and it was suggested that perhaps the turbulent blood flow in the perforating vessels was the cause for the variceal rupture.

For sclerotherapy, the sclerosant can be either injected directly into the varices to obliterate the lumen, or into the lamina propria and submucosa to produce a fibrous layer over the varix. Intravariceal technique requires a larger volume of sclerosant (3-5ml) in each varix at two or three sites at the lower oesophageal junction, while paravariceal injection requires smaller volume of sclerosant (0.5ml) at multiple sites. Histologic changes<sup>19,20</sup> and the efficacy in the management of active, and prevention of recurrent bleeding are similar in both the techniques.<sup>9,11,21,22</sup>

Some workers<sup>23,24</sup> use balloon tamponade during sclerotherapy to achieve a bloodless field, while

others use it after sclerotherapy. Various types and combinations of sclerosants have been used, including quinine, sodium morrhuate,<sup>3,5,25</sup> ethanolamine oleate, sotradecal,<sup>6</sup> 50% dextrose, absolute alcohol<sup>26</sup> and sodium tetradecyl sulphate<sup>27</sup>. The choice, dosage and combination mostly depends upon the availability, cost and choice of the operator. Time interval between the two courses vary from 1-3 weeks but injections are often initially given weekly for 3 weeks and later every 3-4 weeks until all varices disappear.<sup>28</sup>

Multiple controlled trials have been done to see the efficacy of sclerotherapy in reducing the number of rebleeds and improving the survival time<sup>21,27,29,30</sup>. A trend towards reduction in number of rebleeds was observed and such episodes were seldom life threatening. Improvement in the long term survival has been reported from Kings College.<sup>31</sup>

In some trials, the efficacy of sclerotherapy was compared with balloon tamponade in the management of acute bleeding.<sup>32,33</sup> In both the studies bleeding was controlled in a larger group of patients and fewer deaths occurred in the sclerotherapy group.

Some workers have done prophylactic sclerotherapy in patients who have never bled.<sup>34,35</sup> Selection criteria were large varices, prolonged prothrombin time and the presence of stigmata on varices<sup>36</sup> in one group while it was unselected in another. Both the studies showed a significant reduction in the bleeding episodes while improvement in the survival time was noted in one study. Regular endoscopic examinations at 3 months, 6 months and then yearly are required to check the formation of new varices and inject them as and when needed. Usually few injections (median 2 courses) are required to obliterate new varices and complications of sclerotherapy are rare<sup>28</sup>.

At the international symposium on the prophylaxis of variceal bleeding<sup>37</sup> the pitfalls in the prophylactic treatment were reviewed. It was suggested that apart from geographical variations in the underlying liver disease, patient population and the degree of hepatic decompensation, other risk factors like state of varices, liver status and alcohol abuse should be taken into consideration. Unfortunately neither all these criteria nor the treatment of acute bleeds were matched in most of the controlled trials and, therefore, the results are not absolute.

Early complications of sclerotherapy (within 24hrs) include perforation, aspiration, chest pain and transient fever. Of later complications, oesophageal ulceration is very frequent, but a minor percentage bleeds from this<sup>28</sup>. Full thickness necrosis along with mediastinitis though rare, is often fatal. About 10% cases develop stricture often after 3-4 courses; dysphagia in these cases resolves spontaneously and only a small number requires dilatation. Abnormal oesophageal motility is reported after sclerotherapy<sup>38-40</sup>. Overall mortality with sclerotherapy is about 1-2%<sup>41</sup>.

## REFERENCES

1. Crafoord, C. and Frenckner, P. New surgical treatment of varicose veins of the oesophagus. *Acta Otolaryngol.* (Stockh), 1939; 27:422.
2. Moersch, H.J. The treatment of esophageal varices by injection of a sclerosing solution. *J. Thorac. Surg.*, 1940; 27:4 22.
3. Moersch, HJ. Treatment of esophageal varices by injection of a sclerosing solution. *JAMA.*, 1947; 135:754.
4. Macbeth, R.G. Treatment of oesophageal varices by means of sclerosing injections, in *Proceedings of the Fourth International Congress of Otolaryngology 1949*. London, 1951, p. 294.
5. Macbeth, R. Treatment of oesophageal varices in portal hypertension by means of sclerosing injections. *Br. Med.J.*, 1955;2:877.
6. Fearon, B. and Sass-Kortsak, A. The management of esophageal varices in children by injection of

- scierosing agents. *Ann. Otol. Rhinol. Laryngol.*, 1959; 68:906.
7. Wodak, E. Esophageal varices hemorrhage in portal hypertension; therapy and prevention. *Wien. Med. Wochenschr.*, 1960; 110:5 81.
  8. Denck, H. Endoesophageal sclero.therapy of bleeding esophageal varices. *J. Cardiovasc. Surg.*, 1971; 12:146.
  9. Paquet, K.J. and Oberhammer, E. Scierotherapy of bleeding esophageal varices by means of endoscopy. *Endoscopy*, 1978; 10:7.
  10. Pugh, R.N.H., Murray-Lyon, I.M., Dawson, J.L., Pietroni, M.C. and Williams, R. Transection of the oesophagus for bleeding oesophageal varices. *Br. J. Surg.*, 1973; 60: 646.
  11. Johnston, G.W. and Rodgers, H.W. A review of 15 years experience in the use of scierotherapy in the control of acute gastric haemorrhage from oesophageal varices. *Br. J. Surg.*, 1973; 60: 797.
  12. Bailey, M.E. and Dawson, J.L. Modified esophagoscope for injecting esophageal varices. *Br. Med. J.*, 1975; 2: 540.
  13. Williams, R., Mitchell, KJ., Clarke, A. and Silk, D.B.A. Esophageal scierotherapy, in *Recenti Progressi in Epatologia*. R Williams, L Cantoni (cdi). 1979, pp 45-49.
  14. Williams, K.G.D. and Dawson, J.L. Fibreoptic injection of oesophageal varices. *Br. Med. J.*, 1979; 2:766.
  15. Terbianché, J., Northover, J.M.A., Bornman P., Khan, D., Barbezat, G.O., Sellars, SI., and Saunders, S.J. A prospective evaluation of injection sclerotherapy in the treatment of acute bleeding from esophageal varices. *Surgery*, 1979; 85:239.
  16. Clark, A.W., Macdougall, B.R.D., Westaby, D., Mitchell, KJ., Silk, D.B.A., Strunin, L., Dawson, J.L. and Williams, R. Prospective controlled trial of injection scierotherapy in patients with cirrhosis and recent variceal haemorrhage. *Lancet*, 1980; 2:552.
  17. Macdougall, B.R.D., Westaby, D., Theodossi, A., Dawson, J.L. and Williams, R. Increased long—term survival in variceal haemorrhage using injection sclerotherapy; results of a controlled trial. *Lancet*, 1982;1: 124.
  18. McCormack, T.T., Rose, J.D., Smith, P.M. and Johnson, A.G. Perforating veins and blood flow in oesophageal varices. *Lancet*, 1983; 2:1442.
  19. Evans, DM, Jones, D.B., Cleary, B.K. and Smith, P.M. Oesophageal varices treated by scierotherapy; a histological study. *Gut*, 1982; 23:615.
  20. Helpap, B. and Bollweg. L. Morphological changes in the terminal oesophagus with varices, following sclerosis of the wall. *Endoscopy*, 1981;13:229.
  21. The Copenhagen Esophageal Varices Scierotherapy Project Scierotherapy after first variceal hemorrhage in cirrhosis. A randomized multi-center trial. *N. Engl. J. Med.*, 1984; 311:1594.
  22. Westaby, D., Macdougall, B.R. and Williams, R. Improved survival following injection scierotherapy for esophageal varices; final analysis of a controlled trial. *Hepatology*, 1985; 5: 827.
  23. Kirkhaxn, J.S. and Qualye, J.B. Oesophageal varices; evaluation of injection scierotherapy without general anaesthesia using the flexible fiberoptic gastroscope. *Ann. R. Coll. Surg. Engi.*, 1982;64:401.
  24. Johnson, A.G., Shams, J.M. and Stoddard, C.J. Is there a role for injection scierotherapy in the presence of active bleeding, in variceal bleeding. Edited by D. Westaby, BRD,Macdougall, R. Williams. London, Pitman, 1982, p. 159.
  25. Patterson, C.O. and Rouse., MO. Scierosing therapy of esophageal varices. *Gastroenterology*, 1947; 9:391.
  26. Sarin, S.K., Sachdeva, G.K., Nanda, R., Vij, J.C. and Anand, BS. Endoscopic scierotherapy using absolute alcohol. *Gut*, 1985; 26:120.
  27. Jensen, D.M. Evaluation of scierosing agents in animal models. *Proceedings of the Third International Endoscopy Symposium*. Cleveland, 1983, p. 446.
  28. Williams, R. and Westaby, D. Endoscopic sclerotherapy for oesophageal varices. *Dig. Dis. SeL*,

1986;31: 1085.

29. Terblanche, J., Bornman, P.C., Kahn, D., Jonker, M.T., Campbell, J.H., Wright, J. and Kirsch, R. Failure of repeated injection sclerotherapy to improve long-term survival after oesophageal variceal bleeding. *Lancet*, 1983; 2:1328.
30. Komla, J., Balart, L.A., Radvan, G., et al. A prospective, randomized controlled trial of chronic esophageal variceal sclerotherapy. *Hepatology*, 1984; 5:584.
31. Westaby, D., Melia, W., Gegarty, J. et al. Use of propranolol to reduce the rebleeding rate during injection sclerotherapy prior to variceal obliteration. *Hepatology*, 1986; (in press).
32. Barsoum, M.S., Bolous, F.I El-Rooby, A.A., Rizk-Aflah, M.A. and Ibrahim, A.S. Tainponade and injection sclerotherapy in the management of bleeding oesophageal varices. *Br. J. Surg.*, 1982; 69:76.
33. Paquet, K.H. and Feussner, H. Endoscopic sclerosis and esophageal tamponade in acute hemorrhage from esophagogastric varices. A prospective controlled randomized trial. *Hepatology*, 1985; 5:580.
34. Paquet, KJ. Prophylactic endoscopic sclerosing treatment of esophageal wall in varices — a prospective controlled randomized trial. *Endoscopy*, 1982; 14:4.
35. Witzel, L., Wolbergs, E. and Merki, H. Prophylactic endoscopic sclerotherapy of oesophageal varices. *Lancet*, 1985; 1: 773.
36. Beppu, K., Inokuchi, K. and Koyanagi, N., Nakayama, S., Sakata, H., Kitano, K. and Kabayashi, M. Prediction of variceal hemorrhage by esophageal endoscopy. *Gastrointest. Endosc.*, 1981; 27:213.
37. Ogle, S.J., Kirk, C.J.C., Bailey, R.J., Johnson, A.G., Williams, R. and Murray—Lyon, I.M. Esophageal function in cirrhotic patients undergoing injection sclerotherapy for oesophageal varices. *Digestion*, 1978; 18:178.
38. Sauerbruch, T., Wirsching, R., Leisner, B., Weinzierl, M., Pfahler, M. and Paumgartner, G. Esophageal function after sclerotherapy of bleeding varices. *Scand. J. Gastroenterol.*, 1982;17:745.
39. Soderlund, C. and Thor, K. Esophageal function. after sclerotherapy for bleeding varices. *Acta Chir. Scand.SuppL*,1985;524: 63.
40. Reilly, J.J., Schade, R.R. and Van Thiel, D.S. Esophageal function after injection sclerotherapy. Pathogenesis of esophageal stricture. *Am. J.Surg.*, 1984; 147: 85.
41. Conn, H.O. A plethora of therapies, in variceal bleeding. Edited by D. Westaby, BRD Macdougall, R. Williams. London, Pitman Medical, 1982,P.221.