IS THE VAGOTOMY COMPLETE?

Pages with reference to book, From 279 To 280

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ABSTRACT

Incomplete vagotomy is the single most common cause of ulcer recurrence. Completeness of vagotomy was assessed postoperatively in 17 patients using the congo red test. Various types of vagotomies included truncal vagotomy and gastrojejenostomy in 6, highly selective vagotomy in 5, truncal vagotomy and pyloroplasty in 3 and selective vagotomy with gastrojejenostomy in 3 cases. Congo red test was positive in 13 cases, with 9 of these showing evidence of incomplete vagotomy manifesting as erosions, duodenitis, stomal ulceration or ulcer recurrence (JPMA 41:279,1991).

INTRODUCTION

Two major reasons for incomplete vagotomy are anatomical variations of the vagus nerve and technical failurc both of which contribute to approximately 10-30% ulcer recurrence rate[1-3]. Since the introduction of vagotomy in the treatment of peptic ulcer disease several tests have been evaluated to check its completeness; these include Flollander insulin test[4], 2 deoxy-D- glucose test[5], electrostimulation test[6], pH probe test[7], modified sham feeding test[8] and congo red test[9]. For years the reliability and safety of the insulin test and 2 deoxy-Dglucose test for completeness of vagotomy have been questioned[10], while other tests require elaborate instruments. Congo red, an azine dye indicator, which changes from red to black at pH of 3 or less, was first used clinically in 1942[11] and since then it has been used pre, per and postoperatively with good results[12]. In the present study, the completeness of vagotomy was checked postoperatively using the congo red test in patients who had undergone various types of vagotomies and a correlation was establishedbetween the congo red test and endoscopic findings.

PATIENTS AND METHODS

To check the completeness of vagotomy, 17 patients underwent congo red test postoperatively. These patients were regularly attending the outpatients department of PMRC Research Centre and were operated upon for chronic duodenal ulcer by various surgeons. All patients underwent vagotomy of one type or another which included truncal, selective and highly selective vagotomy. Congo red test was employed postoperatively during routine endoscopy. No sedation was used. Four percent Xylocaine was used for topical anaesthesia. After complete oesophagogastroduodenoscopy all gastric secretions were aspirated through the endoscope. One hundred ml of 5% sodium bicarbonate solution was instilled in the fundus and body of the stomach via a thin polythene catheter passed through the biopsy channel of the endoscope. After 2 minutes the solution was completely aspirated and, through the same polythene tube, 50 ml of 3% congo red solution was instilled over the fundus and body of a slightly insufflated stomach. Appearance of black patches was looked fof, over the fundus and body. Change in colour from red to black usually appeared within few minutes of instillation of congo red solution. Small/discrete areas of discoloration were generally not taken as a positive test while large patches were indicative of incomplete denervation.

RESULTS

Seventeen patients underwent congo red testing to check the completeness of vagotomy. Except for 1 female, all were males, whose ages ranged from 15-62 years. Various surgical procedures included truncal vagotomy and gastrojejenostomy (TV+GJ) in 6, highly selective vagotomy (HSV) in 5, selective vagotomy and gastrojejenostomy (SV+ GJ) in 3 and truncal vagotomy with pyloroplasty (TV+ P) in 3 cases. The time lapse between surgery and congo red testing ranged between 6 weeks to 5 years. Of 17 patients, congo red test was positive in 13 (76%) cases - The site of maximal discoloration or big black patches was greater curvature of the stomach and fundus in 5, greater curve only in 4 and both greater and lesser curve in 4 cases. Greater curvature of the stomach was commonest site of incomplete denervation in all cases. The results of congo red test after various types of vagotomies and the endoscopic findings are shown in the accompanying table.

Table. Endoscopy and congo red test in various vagotomies.

Vagotomies	Time of endoscopy	Complaints	Endoscopy findings	Congo red test
1. TV+GJ	6 M	None	Normal	+ve
2. TV+GJ	6 M	None	Normal	-ve
3. TV+GJ	5 yr	Malaena	Stomal ulcer	+ve
4. TV+GJ	4 yr	Pain	Stomal ulcer	+ve
5. TV+GJ	6 M	None	Duodenitis	+ve
6. TV+GJ	6 wk	None	Stomal erosions	+ve
7. TV+P	5 yr	Pain bleed	Duodenal ulcer	+ve
8. TV+P	5 yr	None	Normal	-ve
9. TV+P	2 yr	None	Normal	-ve
10. HSV	6 M	None	Erosions in cap	+ve
11. HSV	6 M	None	Normal	+ve
12. HSV	12 wk	None	Duodenitis	+ve
13. HSV	5 yr	None	Pre-pyloric erosions	+ve
14. HSV	1 yr	Pain	Duodenal ulcer	+ve
15. SV+GJ	6 wk	dysphagia	Normal	-ve
16. SV+GJ	6 wk	None	Stomal erosions	-ve
17. SV+GJ	12 wk	None	Normal	+ve

TV+GJ: Truncal vagotomy + gastrojejenostomy
TV+P : Truncal vagotomy + pyloroplasty
HSV : Highly selective vagotomy
SV+GJ: Selective vagotomy + gastrojejenostomy

Four patients with positive congo red test showed no lesion on endoscopy; while one patient with a negative test had stomal erosions on endoscopy. Most of the patients were asymptomatic after surgery and no correlation was found between the symptoms and endoscopic findings or congo red positivity.

DISCUSSION

Truncal vagotomy is the oldest and most widely practised surgical procedure for peptic ulcer disease. With truncal vagotomy and drainage, recurrence rates of 3-10% have been reported[2,13]. Addition of antrectomy was advocated and done to protect against incomplete vagotomy and this demonstrated a low recurrence rate, although positive insulin test was noted postoperatively[2]. One of the reasons for incomplete vagotomy is the anatomy of the vagii. In 12% of the cases there are more than 2 vagal trunks[1]. With a move towards selective and highly selective vagotomies, this anatomical fact attains importance, as the likelihood of overlooking a significant branch of the vagus would increase. In an attempt to recognise incomplete vagotomy, various ingenious tests have been devised. Ml of these tests have some inherent disadvantages. The Burge and Vane test[14] requires mechanical devices of large size, staining of neurofibres[15] requires actual visualization of the nerve fibres, and the risk of insulin hypoglycaemia in Hollander test has reduced its practical application. The congo red test done postoperatively during routine endoscopy is safe and reliable with a high positive yield. The red dye indicator turns black at a pH of less or equal to 3.0 and adheres to the mucosa. Under basal conditions, blackening is evident within 1-3 minutes where vagal innervation exists[12]. This test is significant when a large area remains positive. Elevated gastrin levels seen after vagotomy do not produce false positive results as gastrin stimulation would produce diffuse staining instead of patchy distribution seen after parietal cell denervation. In a study done by Saik et al[9], congo red test was done pre and postoperatively in patients undergoing vagotomy. They considered this test as the main means of detecting adequacy of vagotomy in their series. Knowledge of completeness of denervation in-traoperatively would minimize the risk of incomplete vagotomy. The high rate (76%) of incomplete vagotomy in the present series would justify its application intraoperatively to improve surgical technique and ensure completeness of vagotomy.

REFERENCES

1. Sksndalakis, J., Rowe, IS. Jr., Gray, S.W. and Androulakis, J. Identification of vagal structures at the oesophagel hiatus. Surgery, 1974;73:233.
2. Jordan, P.H. Jr. and Condon, RE. A prospective evaluation of vagotonsy-pyloroplasty and vagotomy-antrectomy for treatmenrof duodenal ulcer. Ann. Surg., 1970;172:547.
3. Stabile, BE. and Passaro, E. Jr. Recurrent peptic ulcer. Gastroenterology, 1976;70:124.
4. Hollander, F. Laboratotyprocedures in the studyofvagotomy (with particularreference to the insulin test). Gastroenterology, 1949;11:419.
5. Iscnberg, J.I. Insulin versus 2-deoxy-D-glucose or 2 DO or not 2DG. An unanswered question. Gastroenterology, 1972;63:701.
6. Junginger,T. sod Walgenbach, S. The electrostimulatioñ test for intraoperativeeontrol ofvagotomy. Acts Chir. Scand., 1986;152:463.
7. Johnson, AG. and Baxter, H.K. Where is yourvagotomy incomplete? Observations on operative technique. Fr. J. Surg., 1977;64:583.
8. Feldman, M., Richardaon, CT., Fordtran, J.S. Experienccwith sham fcedingaa a teat for vagotomy. Gastroenterology. 1980;79:792.
9. Saik, R.P.. Greenburg. AG., Farria, J.M. and Peskin, O.W. The practicalityoftheCongo Red teat, or iayourvagotomy complete? Am. J. Surg., 1976;132:144.
10. Grossman, M.l.Some minorheresies aboutvagotomy. Gastroenterology, 1974;67: 1016.
11. Lerner, H.H., Aaher, L. and Andrews, K The excretion of neutral red by the gaetric mucosa

aavisualized gastroscopically. AmJ. Dig. Dia., 1942;9:109.
12. Kusakari, K, Nyhus, L.M., Gilli,on, E.W. and Bombeck, c.T. An endoscopic test for completeness ofvagotomy. Arch. Surg., 1972;105:386.
13. Farris, J.M. and Smith, G.K Appraiaal of the long-term results of vagotomy and pyloroplasty in 100 patientswith bleeding duodenal ulcer. Ann. Surg., 1967;166:630.
14. Burge, H. and Vane, JR. Method of testing forcomplete nerve aection duringvagotomy. Br. Med.J., 1958;1:615.
15. Graasi, 0. and Orecchia, C. A comparison of intraoperative teats for eompleteneas of vagal section. Surgery, 1974;75:155.