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## TWELVE YEARS EXPERIENCE IN HIGHLY SELECTIVE VAGOTOMY

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### Summary

Highly selective vagotomy accepted by increasing number of surgeons due to its low operative risk and relative lack of all side effects associated with other types of surgery like Truncal Vagotomy and drainage procedures. Our study concentrates on cases of chronic duodenal ulcer operations by H.S.V. regarding morbidity, mortality and recurrence rates. At Port General Hospital in Basrah and one private hospital over a period of twelve years from January 1991 to January 2002 (H.S.V.) Highly selective vagotomy was performed on 100 cases of chronic duodenal ulcer (D.U.) which were diagnosed by endoscopy. All patients were followed for periods ranged between (24-120) months post operative morbidity and mortality were recorded. Visick grading was used to assess the post-operative clinical results, and endoscopy was done for all patients with visick grades III and IV. Seventy four (74) cases were uncomplicated and twenty six (26) were complicated ulcers (12 with obstruction, 10 with bleeding and 4 with perforation). Seventy two (72) cases were males and 28 cases were females. Their age ranged between (16-72) years. No major post-operative complication was recorded apart from one case who developed recurrent obstruction corrected by Finney pyloroplasty. Minor complications recorded were transient dysphagia (in 32 cases 32%) parasitic diarrhoea in eight (8) cases (8%), and some other non-related complications. Mortality was nil. (11 cases) were in Visick grade III and IV. Nine (9) cases of them were proved to have recurrent ulceration 89 cases were in visick grades I and II. My result shows that H.S.V. is a safe and effective procedure in the Management of uncomplicated and complicated chronic D.U. with less morbidity and mortality with accepted and medically controllable recurrence rate

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### Introduction

**H**ighly selective vagotomy (HSV) for treatment of chronic duodenal ulcer is established now. The acceptance of this procedure by increasing number of surgeons is mainly due to its low operative risk and relative lack of all side

effects associated with vagotomy and its obligatory drainage procedures<sup>1-3</sup>.

The selective nerve supply to the stomach and pylorus had been evaluated experimentally in animals since 1937 by Griffith and Harkins, Wilkinson did parietal cell vagotomy without drainage in 1969<sup>(1)</sup>, and some name it proximal gastric vagotomy. It was primarily fashioded for uncomplicated duodenal ulcer, now it's use had been expanded to treat complicated duodenal ulcer, having

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gastric outlet obstruction, bleeding and perforation<sup>4-8</sup>.

The morbidity and mortality rate of H.S.V is minimal compared to other procedures, but the recurrence rate is somewhat higher and controversial and seems to be related very much to the experience and skill of the surgeon and the meticulousness and completion of the procedure. Recurrence rate as low as 1.5% had been reported by some surgeons<sup>9</sup>, while rates reaching up to 23% have been reported also<sup>10</sup>. With the rapid advance of laparoscopic surgery, HSV can be done now laparoscopically<sup>11</sup>.

The aim of the present study was to see the result of H.S.V. in treating uncomplicated and complicated duodenal ulcers concentrating on the morbidity, mortality and recurrence rate.

## Patients and Methods

Hundred patients with chronic duodenal ulcer were operated on at Port General Hospital and private hospital in Basrah from January 1991 to January 2002. All patients had been fulfilled the indications of surgery starting from failure of medical treatment to intractability ended with complications like obstruction, bleeding and perforation. Upper gastrointestinal endoscopy were carried out for all patients before surgical treatment. Pre-operative investigations included complete blood picture, blood urea, serum creatinine, fasting blood sugar, chest X-ray and ECG if needed.

A period of pre-operative preparation was taken to correct the pathophysiological changes that happened in cases of obstruction, bleeding and perforation, accordingly.

One pint of blood was prepared at first in all cases but later blood prepared only in cases of bleeding.

Under general anesthesia, an upper mid line incision was used in all cases. A

sand bag were put beneath the patients upper abdomen in all patients. A sternal elevator was used in most of the patients. Exploration of the abdomen was done, the ulcer was confirmed and the never of latorjet was clearly defined in all. Classical H.S.V. were done for all patients. In cases of gastric outlet obstruction, it was accompanied by another procedure to overcome the obstruction, these procedures were either:

- a) Duodenoplasty, done in (7) patients with distal bulbar and post bulbar obstruction.
- b) Pyloroplasty done in (5) patients with pyloric or proximal bulbar obstruction. Either Finneys or Heineke Mikulicz pyloroplasty was used.

Duodenoplasties and pyloroplasties were sutured by single layer of interrupted gambee's or mucosa sparing sutures, using polyglactin 910 or polypropylene.

In cases of bleeding D.u. duodenotomy was done with under running of the base of the ulcer by vicryl suture, then it was closed longitudinally. In cases of perforation a suture of the perforation by absorbable suture was added.

The abdomen was closed drainage in early cases but later drainage was used only in complicated cases. A nasogastric tube was used in all cases at the beginning, but later it was removed at the end of the operation in uncomplicated cases.

Intravenous fluids were given for a bout twelve hours post operatively in uncomplicated cases and patients were started on a fluid, then soft diet for few days. Normal diet resumed on about the 7<sup>th</sup> day of the operation. Specific and non-specific postoperative complications were recorded.

Patients had been followed up clinically and Visick grading was

allocated for each patient. Those who were in grade I and II were considered successful. Those in grade III and IV were considered unsatisfactory results - and had endoscopy done for them. Post-operatively, patients were followed for periods ranged between 2 -10 years .

## Results

Hundred patients included in our study, their age range between 16 years and 72 years with a mean age of (44) years. Seventy two cases were males (72%) and (28) patients (28%) were females. Twenty four patients (24%) were having positive family history. Seventy four (74%) patients were having uncomplicated D.u., twelve (12) cases (12%) were having gastric outlet obstruction, Ten cases (10%) were having bleeding and four cases (4%) were having perforation. Table I shows the endoscopic findings in our patients. Table II shows the post - operative complications. Fifty-five patients run a smooth post-operative period without any complication.

No single suture line leak occurred. One patient from the duodenoplasty group developed recurrent obstruction, needed surgery, and a Finney's pyloroplasty was done to relief the obstruction. Thirty two (32) patient (32%) developed transient (self limiting) dysphagia. Parasitic diarrhoea developed in eight (8) patients (8%), which was treated by metronidazole. Seven patients (7%) had chest infection, three patients (3%) had wound infection and two patients (2%) had retention of urine. Follow up ranged between (24-120) months, a mean of (72) months. Eighty - seven patients (87%) were in Visick grade I, two (2) in Visick grade II,

five (5%) patients were in grade III and six (6%) patients were in grade IV, Table III.

Nine patients from grade III and IV returned back with severe dyspeptic symptoms. Ulcer recurrence was confirmed by endoscopy and all patients are happy now with long term maintenance H2-receptor blockers, as show in Table IV. The mortality was Nil in my study.

**Table I: Endoscopies findings**

Endoscopic findings	No. of pats	%
Chronic active anterior D.u	36	36%
Chronic active posterior D.u	18	18%
Chronic active anterior and posterior D.u	20	20%
Pyloric and pre bulbar stenosis and obstruction	4	4%
Distal bulbar and post bulbar stenosis and obstruction.	8	8%
Bleeding posterior ulcer.	10	10%

**Table II: Post-operative complications**

Complication	No.	%
A) Major complication Recurrent obstruction	1	1%

B) Minor complications			
Specific			
1- Transient dysphagia.	32%	32%	
2- Parasitic diarrhoea.	8	8%	
Non-specific			
1- Chest infection.	7	7%	
2- Wound infection.	3	3%	
3- Urine retension.	2	2%	

**Table III: Results assessed By visick scale Comparison**

Author	No. of patients	Grade	%
Koruth & Dua 1999	57	I	61%
		II	14%
		III	21%
		IV	4%
Emas & Eriksson 1992	45	I	47%
		II	7%
		III	15%
		IV	31%
Present study	100	I	87%
		II	2%
		III	5%
		IV	6%

**Table IV: Recurrent ulceration**

Author	No. of pts	(Mean) Years of follow up	Recurrent rate No. %
Fra Zer & Brunt 1983 <sup>(9)</sup>	70	5	(1) 1.5%
Koruth & Dua 1990 <sup>(14)</sup>	57	12	(3) 5%
Emas & Eriksson <sup>(10)</sup>	52	12	(12) 23%
Present study	100	5	(9) 9%

## Discussion

The ideal operation for chronic duodenal ulcer can be determined by three principal factors, operative mortality, post-operative complications

related to the operation itself, and the percentage of recurrent ulceration<sup>7,12</sup>.

The operative mortality rate of H.S.V. was nil in this study. It is lower than the reported mortality in the literature for other types of surgery, which is 0.8 % for truncal vagotomy and drainage procedure reported by Cox et al and 1.6% for truncal vagotomy and antrectomy and (3%) FOR PATIENT WITH gastrectomy<sup>13</sup>, and it is lower and comparable to the mortality rate after H.S.V. reported by Johnston (1975)<sup>2</sup> who made a wide survey and found a mortality rate of 0.3%<sup>2</sup>, 1\3 of which were due to lesser curve necrosis<sup>13</sup> a complication which did not occur in this study.

\*\*H. S.V. is favoured by a lot of surgeons because it has very much less post-operative morbidity and early complications than any other surgical procedure<sup>9,14</sup>, like dumping, diarrhona, weight loss and others. H.S.V. gain it's superiority from the fact that the antral innervations is spared thus preserving the antral pump, and it is not accompanied by any drainage procedure which has many complications related to It<sup>15-17</sup>. H.S.V. related complications like lesser curvature necrosis, which was absent in my series and self limiting transient dysphagia, which occurred in 32% and was due to the dissection around the lower esophagus which is higher than other studies (19.5%) resorted by Fawzi (1999)<sup>14</sup>.

Parasitic diarrhoea occurred in 8% due to the lwo acidity that happen after H.S.V. and it was controlled by a course of metronidazole treatment, in contrast to 18% repted by Fawzi<sup>14</sup>.

Wound infection usually less reported with HSV as compared to other procedures<sup>3,18</sup> because it does not involve opening the stomach and duodenum with the resultant wound internal contamination. It occurred in 3% of cases which is lower than the

other studies 10.9% reported by Fawzi<sup>14</sup>, 18.3% by Byrne but it is a bit higher than what was reported by Brunt (1.4%)<sup>15</sup>.

H.S.V. was primarily fashioned for the uncomplicated duodenal ulcer<sup>1-3</sup> but later on when its use expanded to complicated cases we shift to use it in cases with complications<sup>4-8</sup>.

In cases of bleeding D.U only duodenotomy with under running of the base of the ulcer was done, which is sutured longitudinally preserving the integrity of the pylorus which is a great achievement and gave good results as in other studies<sup>6,7,19</sup> and in contrast to truncal vagotomy and pyloroplasty which used to be done damaging the integrity of the pylorus with its bad sequelae<sup>15,18</sup>.

In cases of obstruction, duodeno-plasty is an alternative choice in cases of distal bulbar and post bulbar obstruction, by which again the physiological and anatomical integrity of antral pump is not violated. We had one failure in these cases (1/7), who developed recurrent obstruction corrected by Finney's pyloroplasty with satisfactory outcome. Similar good results were also reported by other studies<sup>4,10,20,21</sup>. In cases of pyloric or proximal bulbar obstruction, pyloroplasty when added to H.S.V. is a satisfactory solution, although the pyloric sphincter is destroyed, great gain is obtained by preserving the propulsive activity of the antrum<sup>(19-2)</sup>. The major disadvantage of pyloroplasty is a faster gastric emptying<sup>23</sup> which is not of much significance in provoking major clinical symptoms. Some surgeons<sup>22,24</sup> add gastro jejunostomy to H.S.V. I did not use it because of its variety of

mechanical complications and both duodenoplasty and pyloroplasty were more physiological in order regarding the benefit of mixing food with biliary and pancreatic secretions than gastro-jejunosotomy.

In cases of perforation, as we know, definitive treatment is used in early cases of perforation and patients who are fit for long surgery previously we accustomed to use truncal vagotomy with pyloroplasty but when HSV established we used it as a definitive treatment with classical closure of the perforation and it gave good results without any complication apart from two cases developed wound infection, as compared to other studies<sup>(7,19)</sup>.

Eighty – nine cases felt into Visick grade I and II with very good result, only eleven cases (11%) felt into Visick grade III and IV, from these 9 cases were proved to have ulcer recurrence which is accepted as compared to the literature which showed that ulcer recurrence was the main disadvantage of HSV being so high that it can reach up to 23%<sup>14,20</sup>, but it is a little higher than other studies, like Frazer and Brunt which showed only 1.5% recurrence<sup>9</sup> and Korth and DUA which showed 5% recurrence<sup>15</sup>, while the other three cases found in the pyloroplasty group had reflux bile gastritis.

So in conclusion my favorable results showed that H.S.V. is a safe and effective procedure in the management of uncomplicated and complicated chronic duodenal ulcers with less morbidity and mortality and accepted and controllable recurrence rate.

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