Early vagotomies at Henry Ford Hospital: An historical vignette and a follow-up

James C. Gruenberg
Conrad R. Lam

Follow this and additional works at: https://scholarlycommons.henryford.com/hfhmedjournal

Part of the Life Sciences Commons, Medical Specialties Commons, and the Public Health Commons

Recommended Citation
Available at: https://scholarlycommons.henryford.com/hfhmedjournal/vol25/iss1/6

This Article is brought to you for free and open access by Henry Ford Health System Scholarly Commons. It has been accepted for inclusion in Henry Ford Hospital Medical Journal by an authorized editor of Henry Ford Health System Scholarly Commons.
Over a one-year period beginning in April, 1946, nine transthoracic vagotomies were done at the Henry Ford Hospital. Three of the patients had had a partial gastrectomy previously and the operation was done for recurrent bleeding from marginal ulcers. Thirty years later, an attempt was made to ascertain the present condition of these patients. Long term follow-ups were possible on six patients and follow-ups of one, six and 14 years on the others. All nine patients had immediate relief of ulcer pain and cessation of bleeding if present. No subsequent drainage operation was required for the six patients with primary vagotomy and no additional operations were done on the three patients with previous surgical procedures. Late recurrent bleeding was noted in only one patient (who had had two previous gastric operations), and recurrence of ulcer symptoms in the others was rare and of mild degree. In an attempt to explain why "pure" vagotomy did not continue to be recommended for the surgical treatment of peptic ulcer, a review is presented of significant reports from important surgical centers during the ten years which followed.

In April 1946, the speaker at the evening meeting of the Henry Ford Hospital Medical Society was Dr. Lester Dragstedt of Chicago. His subject was the "hot one" of the surgical scene, "Vagotomy for Peptic Ulcer." There was standing room only in the auditorium-gymnasium of the old Education Building. A late arrival was a surgeon who had come 200 miles from Grand Rapids, but the most interested listener was a young doctor who was an inpatient at the time. He was suffering from a marginal ulcer, which followed a previous partial gastric resection for bleeding ulcer. He was impressed with Dragstedt's presentation, and requested that he have a vagotomy. It was done the next day. Within a year, eight other patients with peptic ulcers received the operation and are the basis of this study: a 30-year follow-up of these first vagotomies at the Henry Ford Hospital and probably in Michigan.

Most bibliographies of the subject of vagotomy begin with a paper by Dragstedt and Owens, which was published in 1943 in the Proceedings of the Society of Experimental Biology and Medicine, a journal whose contents consist mostly of laboratory research reports. The choice of the journal was undoubtedly influenced by the fact that Dragstedt was a practicing physiologist as well as a surgeon, and the Proceedings provided a medium for rapid publication of new work. This report was followed promptly by papers in five leading clinical journals, and vagotomy was on its way. Although Dragstedt is generally credited
with originating vagotomy, the veteran gastroenterologist and editor Walter C. Alvarez was able, in 1948, to write a paper with the title “Sixty Years of Vagotomy: A Review of Some 200 Articles.”

The vagotomies on the nine patients of Henry Ford Hospital were done by one of us (Conrad R. Lam, MD) by the transthoracic route. The chest was entered through the seventh left interspace. The mediastinal pleura was opened to expose the lower esophagus which was mobilized, and both vagus nerves were visualized. Segments of the nerves were removed and the proximal ends of the nerves were directed cephalad and were sutured outside the mediastinum to preclude any possibility of regeneration and restoration of continuity of the nerves.

Table I has two columns of results, one for the “immediate result” and another for the long-term result. For an evaluation of the immediate result, one would be more interested in the possible occurrence of side effects than in the near-term relief of pain and bleeding. A tendency to gastric atony was expected and treated by nasogastric drainage for several days. At the time of discharge from the hospital, most of the patients had less than 10% retention of the barium meal. Persistent symptoms of delayed emptying were present only in the young man (Case 7) who went to Okinawa very shortly after his operation. Because of recurrent vomiting, he was evacuated back to the base hospital in Tacoma, Washington, where upper gastrointestinal x-ray studies were negative except for deformity of the duodenal bulb. He was pronounced fit for return to duty and a letter from him stated that he was on his way back to Guam. He summarized his army duty as follows, “up to now I’ve had a very enjoyable vacation with two sea voyages and it hasn’t cost me too much.” Unfortunately, no further follow-up was possible on this young man.

The postoperative notes mention diarrhea or increased frequency of stools in only four patients, and this never persisted for more than four weeks. In the last column of Table I, it is mentioned that this patient (a physician) developed diarrhea six years after the vagotomy and seven years after partial gastric resection. He had many greasy stools and the diagnosis of non-tropical sprue was made. In 1957, or 11 years after the vagotomy, he developed a peculiar syndrome of pain in the muscles of the legs and some parathesias. There was never any explanation for what was tentatively called “polymyositis” or “peripheral neuritis.” It was wondered if his sprue-like trouble with poor digestion of fat and meat could have some etiologic bearing. An incomplete follow-up indicates that the patient has had no further trouble relating to his ulcer problem, and is practicing as a physician in a southern state.

On the other and more positive side of the ledger, the following statements can be made regarding these nine patients with vagotomy. All patients were immediately relieved of ulcer pain, and bleeding, if present, ceased. No patient had a subsequent operative procedure. Recurrent bleeding occurred in only one patient (Case 2), and he had had two operations on the stomach, a gastroenterostomy 40 years before the vagotomy, and a partial gastric resection 11 years before.

**Gastric analyses**

All of the nine patients had pre- and postoperative gastric analyses for hydrochloric acid. All showed a reduction, but there was no correlation between the evidence of the degree of vagotomy and the clinical response, which was good in all nine.

**Discussion**

A follow-up of these nine cases at one year or three years would have indicated that vagotomy alone or as an addition to a previous partial gastrectomy is good treatment for the ulcer patient. So would this follow-up after 30 years. Why then was vagotomy as
<table>
<thead>
<tr>
<th>Series Number</th>
<th>Initials</th>
<th>Age</th>
<th>Duration of Symptoms (yrs.)</th>
<th>Remarks</th>
<th>Immediate Result</th>
<th>Years Follow-Up</th>
<th>Subsequent History and Present Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>R.v.H.</td>
<td>24</td>
<td>3</td>
<td>Gastric resection in 1945; recurrent bleeding.</td>
<td>Excellent; no further bleeding.</td>
<td>30</td>
<td>Late period of diarrhea? Sprue; working as a physician.</td>
</tr>
<tr>
<td>2.</td>
<td>C.M.</td>
<td>60</td>
<td>30</td>
<td>Gastroenterostomy in 1916; gastric resection in 1935; recurrent bleeding.</td>
<td>Excellent; mild diarrhea one month.</td>
<td>21</td>
<td>Bleeding 2 years and 10 years p.o.; died of leukemia at age 81.</td>
</tr>
<tr>
<td>3.</td>
<td>P.F.</td>
<td>27</td>
<td>10</td>
<td>Very nervous; heavy smoker.</td>
<td>Excellent; dysphagia &amp; mild diarrhea 4 wks.</td>
<td>6</td>
<td>Episode of pain 2 years p.o.; deserted family in 1952; no follow-up.</td>
</tr>
<tr>
<td>4.</td>
<td>J.B.</td>
<td>27</td>
<td>4</td>
<td>Referred by self after reading about Dragstedt lecture. GI consultant advised medical treatment.</td>
<td>Excellent.</td>
<td>29</td>
<td>No further ulcer symptoms; film in 1975, negative; advised to stop smoking.</td>
</tr>
<tr>
<td>5.</td>
<td>S.S.</td>
<td>45</td>
<td>23</td>
<td>Several episodes of bleeding; heard Dragstedt's lecture and wrote him.</td>
<td>Excellent.</td>
<td>26</td>
<td>No symptoms in 1972; diabetic; lost to follow-up.</td>
</tr>
<tr>
<td>6.</td>
<td>V.R.</td>
<td>32</td>
<td>6</td>
<td>Ulcer crater present.</td>
<td>Excellent.</td>
<td>14</td>
<td>No symptoms in 1960; lost to follow-up.</td>
</tr>
<tr>
<td>7.</td>
<td>D.W.</td>
<td>34</td>
<td>5</td>
<td>Duodenal cap deformed.</td>
<td>Gastric retention 50% at 4 wks. Left for Okinawa.</td>
<td>1</td>
<td>Evacuated from Okinawa; mild retention; discharged from Army Hospital as O.K.</td>
</tr>
<tr>
<td>8.</td>
<td>H.S.</td>
<td>51</td>
<td>18</td>
<td>One episode of bleeding.</td>
<td>Excellent.</td>
<td>30</td>
<td>Episode of pain after &quot;several years&quot; and in 1974; managed medically.</td>
</tr>
</tbody>
</table>
Gruenberg and Lam

the primary surgical procedure given up at the Henry Ford Hospital and other centers?

The most logical explanation is that the results in this small series were better than in other and larger series.

The status of vagotomy with American surgeons in the Spring of 1947 is well reflected in a symposium of four papers presented at the annual meeting of the American Surgical Association at Hot Springs, Virginia. Dragstedt was given the last word, not only in the line-up of papers but in the discussion. The title of the paper by Waltman Walters and his associates from the Mayo Clinic was “A Study of the Results, Both Favorable and Unfavorable, of Section of the Vagus Nerves in the Treatment of Peptic Ulcer.” Walters had personally done the operation of “gastric neurectomy” as he preferred to call it 40 times. Twenty-eight patients had duodenal ulcer, seven had gastrojejunal ulcer (hence had a previous resection) and five had gastric ulcers. Only 14 cases had vagotomy alone; in 13 of these, the results were satisfactory as measured by relief of pain, reduction of acidity and reduction of secretions. There was disturbance in motility with gastric retention in 4 of 10 duodenal ulcer patients. He said “among the patients who had gastrojejunal ulcers, immediate results of the operation have been very satisfactory.” The results for gastric ulcers were less satisfactory. Walters concluded, “for the time being, the operation of gastric neurectomy must be considered to be in the investigative stage and the effects of the operation carefully studied.”

Francis D. Moore gave a follow-up report on the cases at the Massachusetts General Hospital, a preliminary report having been given on 12 cases the year before in the New England Journal of Medicine. The latter paper had among its conclusions, “this procedure appears to be a potent weapon in dealing with peptic ulceration, as judged by clinical results in these early follow-ups. The value of this method must await the passage of time and careful study of the patients operated on at this and other clinics.” By March of 1947, he could report that 84 patients had had the operation, and the clinical results of 74 had been evaluated. He summarized by saying that “satisfactory results have been obtained in approximately 90 per cent of the cases. A poor result may be due to difficulty with the ulcer, but may also occur when side-effects are of a massive and crippling type; the minor gastrointestinal side-effects are not vitiated by the performance of gastroenterostomy. Good results have been obtained in patients who were intractable to all forms of therapy including subtotal gastrectomy. Vagus section is an addition to the surgical armamentarium which may come to occupy a permanent and important place. A reserved attitude must be maintained until the present groups of patients have been followed longer…”

The third paper presented by R. Arnold Griswold of Louisville consisted mainly of the presentation of laboratory studies in 34 cases. However, in his closing discussion, he said, “I will simply say that the results have been satisfactory to us and to the patients with about the same ratio of good results and side effects as presented by the other speakers.”

In the final paper of the symposium, Dragstedt said that 212 vagotomies had been done at the University of Chicago, and the results in 160 of these has been analyzed for the meeting. There had been only one death, and that was from aspiration pneumonia. In 142, studies indicated that the vagotomy had been complete. At this time, he was recommending the transabdominal approach, so that if cicatricial stenosis of the pylorus was found, a gastroenterostomy could be done. He did not say how many times he had done a drainage procedure. There were only five instances of ulcer symptoms, and he attributed these to incomplete vagus section.

The four papers were followed by considerable discussion, which occupied 10 pages.
Early vagotomies

in the Annals of Surgery. Crimson of Duke University had done 77 vagotomies. He noted that with few exceptions healing or quiescence of ulcer occurred. However, he had had to do seven secondary gastroenterostomies, and his group was employing subdiaphragmatic vagotomy with pyloroplasty, exclusion or gastrojejunostomy for duodenal ulcer, reserving vagotomy alone for stomach ulcer. Colp of New York also had done 77 cases. Fearing an increasing incidence of gastrojejunal ulcer, he said his treatment for duodenal ulcer would be gastric resection and vagotomy. Good results had followed vagotomy for 12 patients with gastrojejunal ulcer. He did not agree with Crimson that transthoracic vagotomy was indicated for gastric ulcer, because he feared that malignancy might be present. Dr. Frank Lahey uttered the same word of caution about gastric ulcers, and said “We would like to select a series of uncomplicated duodenal ulcers in which we could do a transthoracic vagotomy without the need of other complicating operations such as gastroenterostomy, with the hope that we could eventually interpret for ourselves the value of this procedure.”

Thorlakson reported that at the Winnipeg Clinic they had done 39 vagotomies. The immediate results had been excellent, and side effects had not been serious. Edwin Miller of Chicago reported that his group was pleased with the results in 40 cases. Wangensteen said that after Waltman Walter’s talk on vagotomy in St. Paul, enthusiasm for the procedure had definitely waned in the Twin Cities! In his closing remarks to the symposium, Dragstedt answered some questions which had been raised about the pathophysiology of ulcer and the physiologic effects of vagotomy. It is likely that he felt that vagotomy as an adjunct in the surgical treatment of ulcer had survived the rigors of discussion by his peers in the American Surgical Association!

By 1951, Waltman Walters15 of the Mayo Clinic was able to report on their experiences with 331 vagotomy operations. Some of the tables in the rather detailed report give the results of 2,558 cases collected for the American Gastroenterological Association by Dr. Sara Jordan of the Lahey Clinic. The following are quoted from the two and a half page summary: “After treatment of duodenal ulcer with vagotomy alone, 29 patients were followed one to four years. Excellent results were obtained in 62.1%, unsatisfactory results in 31.0%, and poor results in 6.9%. When vagotomy was combined with gas-

Four years later, the participants in the symposium on vagotomy presented progress reports. By this time, some patients had been followed seven years. In a paper presented before the Section on Surgery, General and Abdominal, of the American Medical Association in June, 1950, Dragstedt14 gave the following summary: “From an appraisal of 509 vagotomy operations for peptic ulcer at the University of Chicago Clinics between January 1943 and January 1950 the following conclusions have been drawn:

1. “Complete vagotomy by a transabdominal transdiaphragmatic approach, combined with a gastroenterostomy of small size, is a relatively safe, efficient and practical method of surgical treatment and should replace subtotal gastrectomy as the initial definitive surgical treatment for duodenal, gastrojejunal, and certain esophageal ulcers.

2. “The complications of vagotomy operations for peptic ulcer are chiefly due to motor disturbances in the stomach and are for the most part trivial and self limited and can be controlled or eliminated entirely by gastroenterostomy and adequate postoperative decompression of the stomach.

3. “Persistence or recurrence of duodenal or gastroduodenal ulcer is almost invariably due to incomplete vagotomy, as evidenced by physiological tests.”
Gruenberg and Lam

troenterostomy for duodenal ulcer, results in 81 patients followed one to four years were excellent in 81.4%, unsatisfactory in 12.4%, and poor in 6.2% . . . There is little evidence in our small series to indicate that vagotomy adds anything to gastroenterostomy in the prevention of gastrojejunal ulcer, although it does produce lowering of gastric acidity in almost all cases and to an achlorhydric level in some. In fact, in some patients troublesome postoperative retention has prolonged hospitalization, increased the expense of maintaining the fluid and electrolyte balance and made necessary excessive and constant care by resident surgeons and attending nurses.

"Vagotomy and gastric resection in nine cases of duodenal ulcer gave excellent results in 55.5% and unsatisfactory results in 44.5%. There were no suspected or proved recurrences of ulcer in this group. However, because of associated postoperative vagal symptoms, it is felt that vagotomy probably was a detriment to gastric resection alone.

"Vagotomy should be reserved for poor-risk patients with gastrojejunal ulceration after gastroenterostomy in cases of small ulcers or gastrojejunitis, since much better results are obtained by undoing the gastroenteric anastomosis and the gastric resection.

"Vagotomy should not be performed for gastric ulceration because of the high incidence of an unsuspected malignant process and because postoperative persisting ulceration and gastritis and disturbances of motility make the results compare unfavorably with the excellent results obtained with gastric resection for this condition. The disagreement with Dragstedt in these conclusions is evident.

Two years later, Brooks and Moore signed off from the vagotomy controversy in a paper with the title "Vagotomy for Duodenal Ulcer: A Final Survey after Ten Years." The study involved 132 patients. In 82 patients with vagotomy alone, 31 had excellent results, 21 satisfactory results, 3 had vagal symptoms and 6 had ulcer symptoms. The results with 36 patients who had vagotomy and gastroenterostomy were excellent in 17, satisfactory in 9, and one each had vagal or ulcer symptoms. Fourteen patients had vagotomy and subtotal gastrectomy. Ten had excellent results, 2 satisfactory results, and 1 patient had vagal symptoms. Their summary and conclusions:

"Vagotomy alone is not a satisfactory primary surgical procedure for duodenal ulcer when competing with subtotal gastrectomy carried out in competent hands and with low mortality.

"The efficacy of vagotomy combined with posterior gastroenterostomy in the treatment of duodenal ulcer is not supported by our data. Judgement must be reserved because of the high incidence of pre-existent marginal ulcer in our small series. More important, however, is the fact that recurrent ulcer may occur while physiologic effects of vagotomy persist.

"The place of vagotomy in the treatment of marginal ulcer after subtotal gastrectomy is substantiated."

A different opinion was given by George Grile, Jr. at the 1952 meeting of the American Surgical Association in a paper with the title "An Analysis of the Vagotomy Controversy." He had had experience with 430 cases. Among his conclusions were the following: "'Side effects' which have been attributed to vagotomy are in reality complications of an improperly functioning gastroenterostomy.

"Vagotomy with gastroenterostomy affords as much protection against recurrent ulceration as a three-fourths gastric resection. More radical gastrectomies result in
Early vagotomies

lower incidence of recurrent ulceration but cause an intolerably high incidence of nutritional complications for which there is no effective treatment.

"Good results were obtained in 90% of patients followed for two to five years after vagotomy with gastroenterostomy. In 3%, gastric resection for marginal ulcer has been required.

"The safety of vagotomy with gastroenterostomy, the absence of side effects when the gastroenterostomy is constructed properly, and the fact that failures are still correctible by gastric resection commends vagotomy with gastroenterostomy as the standard treatment for complicated duodenal ulcer."

This historical vignette began with an account of a medical meeting at the Henry Ford Hospital when the speaker was Lester R. Dragstedt, who had been invited by one of us (C.R.L.). It might conveniently end with the notation that because of agreement with Barney Crile on the points mentioned above, the same one of us in his capacity as Chairman of the Program Committee of the Detroit Academy of Surgery, invited Crile to address the monthly meeting of the Academy on December 11, 1952, his subject, "An Analysis of the Vagotomy Controversy."

In 1947, one of us said in an editorial: "It would appear advisable to evaluate the new physiologic surgical treatment of ulcers as thoroughly and as rapidly as possible."

A review of the surgical literature, some of which is given above, initiated this process which continues to be one of the important areas of experimental and clinical surgery today: a better application of the vagotomy principle in the treatment of peptic ulcer.

References

5. Thornton T F Jr, Storer E H, and Dragstedt L R: Supra-diaphragmatic section of the vagus nerves. JAMA 130:764, 1946
Gruenberg and Lam


