

GASTRIC FREEZING FOR DUODENAL ULCER*

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My interest in this subject was aroused by the heartening prospect of a conservative treatment to replace the operation of gastrectomy.

While constructing the machine to freeze the stomach I corresponded with Prof. Owen H. Wangensteen at the University of Minnesota Medical School. In one of his letters he stated that in the various units working on this research project they had already treated over 1,000 cases and he would be pleased to show me the work they were doing. This seemed such an opportunity to gain years of experience in a couple of weeks that I exchanged my air tickets to Durban, where I was to spend a fortnight, for tickets to Minnesota.

On returning to Johannesburg I found that the lay press had already whetted the enthusiasm of ulcer sufferers to avail themselves of this treatment. In Minneapolis many patients came to the clinic because they had read about the freezing treatment in the *Reader's Digest*.

Prof. Wangensteen is carrying out a comprehensive research project and I feel sure that in the end his efforts will be as generously rewarded as his work on intestinal decompression. In the animal laboratories there are five operating tables in constant use by surgeons working in the team. During my stay I saw an average of 30 operations a day being performed on dogs and rats, all concerned with various aspects and problems of the stomach and its physiology. The results of this work have been adequately published.†

*Impressions gained from a visit to Prof. Owen H. Wangensteen in Minnesota, USA.

†See bibliography (Surg. Forum, 1962, 13, 269; Univ. Minn. Med. Bull., 1962, 34, 108; and Surgery, 1963, 53, 764).

While this laboratory work is going on in the *penetrabilia* of the hospital, 4 or 5 patients a day are being investigated in the wards above and the suitable cases chosen for freezing treatment.

The treatment itself is very simple and carries no risk to life. The only serious complication, in the early stage of this project, was the production of a gastric ulcer. This was due to a technical error, and a slight modification to the end of the efferent tube has eliminated this complication in the last 800 cases. The discomforts that a patient suffers during and after the treatment are the following:

1. The naso-gastric tube. In order to evaluate the effect of freezing on gastric secretion, an indwelling naso-gastric tube is necessary from 11.00 p.m. the night before freezing until the treatment is carried out. This is the most unpleasant part of the treatment. However, it is essential.

2. A feeling of fullness for a week.

3. Belching, which lasts for 4-5 days.

4. Constipation, which usually rights itself with a few doses of milk of magnesia.

5. A few patients have noticed tarry stools lasting up to a week. None of these cases have necessitated any special therapy to control haemorrhage.

The benefits the patients experience in about 80% of cases far outweigh the discomforts. In patients who came to the clinic complaining of ulcer pain or the pain of oesophagitis, there was dramatic relief within 24 hours. Within 3 hours of the treatment the patient can eat a meal, and after a few days is able to indulge in foods that previously were a cause of irritation to the ulcer. Radiologically nearly all existing duode-

nal ulcer craters disappear within 6 weeks of the treatment.

The following are the indications for freezing:

1. Intractable duodenal ulcers.
2. Post-gastrectomy marginal ulcers. (I saw some of the most gratifying results in patients who had undergone gastrectomy and were constantly in pain. After one freeze their symptoms were relieved.)
3. Oesophagogastric dysfunction (e.g. hiatus hernia) in which regurgitation of acid causes oesophagitis and subsequent strictures.
4. Oesophageal varices.

Gastric hypothermia (temperatures of 5-15° C) has been most helpful in arresting haemorrhage from peptic ulcers and bleeding oesophageal varices. This, of course, is cooling—not freezing. In cases of haemorrhage, freezing may aggravate the bleeding when the temperature is allowed to return to normal.

What Prof. Wangenstein has aimed at in his untiring project is to produce a physiological gastrectomy by destroying the acid-producing parietal cells and at the same time to perform a physiological 'vagotomy' by destroying the ganglia and nerve endings of Auerbach's plexus and Meissner's plexus in the wall of the stomach. The treatment has gone a long way to help the intractable cases, and I venture to suggest from the progress being made that improvements in freezing technology will result in suppression of vagal action at the cardiac orifice and also of antral stimulation.

At present the relief of symptoms is not permanent in a number of cases, and after a period of six months they are returning to the clinic with a recurrence of symptoms due to the return of acid secretions. In these patients freezing is being repeated and once again their symptoms are alleviated. The study has only been in progress for less than 2 years and therefore long-term conclusions are not yet possible, but to my mind there is every reason for optimism concerning its future.

Gastric freezing is contraindicated in any form of obstruction at the pylorus and, as stated above, in active bleeding of

the oesophagus or peptic ulcer. It is also contraindicated in active gastric ulcers. The possibility of malignancy is always a factor.

SUMMARY AND CONCLUSIONS

Gastric freezing is a very safe and simple procedure for the treatment of intractable duodenal ulcer and other conditions mentioned above. It should not be performed without due care and careful consideration. All cases should be assessed on the results of their gastric analysis and radiological findings. Careful records should be kept in order to add to the already great amount of data that Prof. Wangenstein has accumulated. I recommend the bibliography to all who are interested in this form of therapy.

From what I have seen in a large series of cases we are on the way to achieving what every surgeon surely must desire, viz. a conservative vagotomy and gastrectomy.

I am indebted to Owen H. Wangenstein for his invitation to visit his unit at the University of Minnesota Medical School, for the kindness and hospitality shown to me, and for the valuable help afforded by his able staff and associates.

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