Infrared Coagulation:
A New Treatment for Hemorrhoids*

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Many methods, which have effectively reduced the number of patients requiring hospital admission, have been described for the outpatient treatment of hemorrhoids. However, complications have been reported, and the methods are often associated with unpleasant side effects. In 1977 Neiger et al. described a new method that used infrared coagulation, which produced minimal side effects.

The authors have conducted a prospective, randomized trial to evaluate infrared coagulation compared with more traditional methods of treatment. The authors' results show that it may be more effective than injection sclerotherapy in treating non-prolapsing hemorrhoids and that it compares favorably with rubber band ligation in most prolapsing hemorrhoids. No complications occurred, and significantly fewer patients experienced pain after infrared coagulation (P < 0.001). [Key words: Hemorrhoids; Outpatient therapy; Infrared coagulation]

Increasing costs of hospitalization and lengthening waiting lists of patients have led to a search for successful outpatient procedures for the treatment of common surgical conditions. Hemorrhoids account for about 20 per cent of the average general surgical practice, and many effective techniques have been described. All have their supporters, but each method has its disadvantages. Neiger et al. recently described a new technique using infrared coagulation, which they found to be free of complications. We have conducted a prospective randomized trial to assess the efficacy of this treatment.

Patients and Methods

One hundred consecutive patients with hemorrhoids were studied at three hospitals between May and July 1980. Full proctosigmoidoscopic examination was performed, and the patients were divided into nonprolapsing (Group I) or prolapsing (Group II) groups. Prolapsing hemorrhoids were defined as those visible on straining, with the proctoscope at the anal margin. The patients in each group (N = 50) were then randomly allocated to receive either infrared coagulation (N = 25) or conventional treatment (N = 25), the latter consisting of injection sclerotherapy or rubber band ligation.

Conventional Treatment: A decision was made on the suitability of the hemorrhoids for injection or rubber band ligation depending on the size of the hemorrhoidal mass and laxity of the mucosa. Injection was performed in the standard manner. Two rubber bands were applied to the base of each hemorrhoid by a technique similar to that described by Groves et al. Not more than two hemorrhoids were banded at each attendance, and patients were requested to confine their bowels for at least 24 hours.

Infrared Coagulation: The apparatus (Infrarot Koagulator, MBB-AT, Munich; Fig. 1) produces infrared radiation from a 14-volt Wolfram-halogen projector bulb surrounded by a gold-plated reflector and focused by a photoconductor (Fig. 2). The tip of the instrument is protected by a polymer-coated cap to prevent adherence to the tissues. The power sup-

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* Received for publication March 16, 1981.
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Fig. 1. The infrared coagulator.
ply unit has a built-in timing device that allows variation in the duration of radiation. A one second pulse is used in the treatment of hemorrhoids. The infrared probe was applied to the base of the hemorrhoid at the site normally used for injection (Fig. 3). At least two points were coagulated on each hemorrhoid; the probe was angled through 90° in a clockwise direction for the second application. Up to six points were coagulated per hemorrhoid, along the base, depending on its size.

All Patients: All patients were advised to avoid straining at stool and to increase their fiber intake, as we believe these measures help in preventing recurrence.4

Follow-up

Patients were reviewed at six-week intervals, and results were assessed by symptomatic improvement and possible side effects. Patients undergoing infrared coagulation who had received previous outpatient treatment were asked which method they found more acceptable.

Results

Group I: Nonprolapsing Hemorrhoids (Table 1). Forty-nine of the 50 patients were available for follow-up at six weeks after initial treatment. Age, sex, length of history, and presenting symptoms were similar in all patients. Those patients undergoing conventional treatment all received injection sclerotherapy. Eighty-five per cent of patients experienced symptomatic relief or improvement; there was no difference between the type of treatment used.

At three months, 39 patients were reviewed. More patients treated with infrared coagulation were symptom-free than those treated by injection, but the difference was not statistically significant. No complications were observed with either method, but significantly more patients complained of pain after injection compared with infrared coagulation ($\chi^2 = 20.3, P = < 0.001$). Thirty-seven patients have completed their course of treatment; there was no difference in the number of attendances required to obtain symptomatic relief.

Group II: Prolapsing Hemorrhoids (Table 2). All 50 patients were available for review at six weeks and three months. Of the 25 patients undergoing conventional treatment, five received injection, and 20 received rubber band ligation, in some cases combined

![Fig. 2. Diagram of infrared generator and conduction system.](image)

![Fig. 3. Site of application of infrared probe.](image)