

Rapid Healing of Peptic Ulcers in Patients Receiving Fresh Cabbage Juice

GARNETT CHENEY, M.D., *San Francisco*

SUMMARY

Thirteen patients with peptic ulcer were treated with fresh cabbage juice, which, experiments have indicated, contains an anti-peptic ulcer factor. This factor (vitamin U) prevents the development of histamin-induced peptic ulcers in guinea pigs.

The average crater healing time for seven of these patients who had duodenal ulcer was only 10.4 days, while the average time as reported in the literature, in 62 patients treated by standard therapy, was 37 days.

The average crater healing time for six patients with gastric ulcer treated with cabbage juice was only 7.3 days, compared with 42 days, as reported in the literature, for six patients treated by standard therapy.

The rapid healing of peptic ulcers observed radiologically and gastroscopically in 13 patients treated with fresh cabbage juice indicates that the anti-peptic ulcer dietary factor may play an important role in the genesis of peptic ulcer in man.

A RECENT series of experiments has demonstrated that an as yet unidentified food factor has completely prevented the development of histamin-induced peptic ulcers in guinea pigs.^{2,3} Experimental studies previously carried out showed that an "anti-gizzard erosion factor" would prevent the development of erosive lesions in chicks' stomachs when the birds were on a deficient diet;¹ and that this same factor, tentatively designated as Vitamin U, would prevent or modify the development of cinchophen-produced peptic ulcers in the stomachs of chicks.^{4,5} In 1936 Fauley and Ivy reported the prevention by diet of postoperatively induced jejunal ulcers in dogs.⁸ The results of these animal studies dealing with the genesis and prevention of peptic ulcers raise the question of whether some dietary factor may not be involved in the formation of gastroduodenal ulcers in man.

During the period of World War II the use of a diet rich in this anti-peptic ulcer factor was applied to the treatment of soldiers in the Army.^{6,9} No

"routine medications" were given. Several hundred patients were successfully treated with the diet but no proof that its efficiency was due to Vitamin U was established. If the resistance of the gastroduodenal mucosa to acid erosion and peptic digestion can be influenced in animals by a dietary factor, studies of its possible effect in man certainly require further observation, as the results obtained in treating soldiers were at least encouraging. As the guinea pig studies showed that both fresh whole cabbage leaves and cabbage juice were effective in completely preventing the formation of peptic ulcer in these animals, it seemed justifiable to try treating a series of peptic ulcer patients with cabbage juice.

SELECTION OF PATIENTS

It was decided that a preliminary or pilot study could best be carried out by observing ulcer crater "healing time" as described by Cummings and co-workers.⁷ The expression "healing time" was used to designate the time interval between the original visualization of the crater by x-ray studies and subsequent non-visualization following a course of medical treatment. These investigators studied 63 cases of duodenal ulcer and six cases of gastric ulcer by this method. They found the average healing time for 62 of the patients with duodenal ulcer to be 37 days, with a range of 13 to 68 days. The average time in the six cases of gastric ulcer was 42 days with a range of 18 to 68 days. (See Figure 1.) All the patients received the same therapeutic regime which can be briefly described as "routine" and included hospital care, bland diet, frequent feedings of milk, alkalization, antispasmodics, regular sedation and limitation of the use of tobacco. Pollard and co-workers have reported similar studies of gastric ulcer crater healing time with similar results.¹⁰

As these two series of cases of peptic ulcer which have been recorded in the medical literature establish the general trend of the healing time of craters in patients treated by the usually accepted methods of therapy, a small series of patients with peptic ulcer has been treated with cabbage juice so that the crater healing time might be compared with the "control" series from the literature. While such a comparison is not perfectly satisfactory, it seemed probable that any obvious deviation from the already recorded healing time might be considered significant.

Only patients with obvious peptic ulcer craters were selected for the present series. Crater size was

Department of Medicine, Stanford University School of Medicine, San Francisco.

The experimental study here reported was supported by a grant from the Eli Lilly Company.

classified by diameter as small (3-5 mm.), moderate (6-8 mm.), and large (9-21 mm.).⁷ Treatment of seven patients with duodenal ulcer, five with gastric ulcer and one with gastrojejunal ulcers has been completed. Four are females and nine are males. They range in age from 26 years to 72 years (see Table 1.) Six were on the clinic ward of the Stanford University Medical School, five were from private practice, one was from the Veterans Administration Hospital in Oakland, and one was from the Indianapolis City Hospital Service of Eli Lilly and Company. The data relative to this last patient was furnished through the courtesy of Dr. Woodson C. Young. All patients were hospitalized throughout the period of experimental therapy.

These patients were observed during the five months from July 1948 to November 1948, inclusive. They were selected basically because they had readily demonstrated ulcer craters, but a number of similar patients were rejected for experimental study because circumstances did not permit their following the complete therapeutic regime prescribed. No patients were rejected because they had ulcers that were "too bad" to treat medically. In fact, four patients (cases 4, 9, 10 and 13 in Table 1) were thought to have chronic duodenal lesions with scarring which might heal slowly and incompletely.

METHOD OF MANAGEMENT

All 13 patients with peptic ulcer in this series were studied by x-ray examination immediately prior to the beginning of experimental therapy and again after six to nine days of treatment. In two cases, 9 and 13, treatment was continued for 23 days and 14 days respectively, and the patients were then re-examined by x-ray. All patients were on bed rest until pain ceased, and then were permitted to be up and about as desired. No routine medications of any kind were permitted. However, patients were given bicarbonate of soda in 0.65 gm. doses or codeine sulphate in 0.065 gm. doses as indicated for abdominal pains, and mild sedatives at bedtime if needed for sleeplessness. Milk of magnesia was occasionally ordered to relieve constipation. All the patients were permitted to smoke as many cigarettes as desired but alcoholic beverages were forbidden.

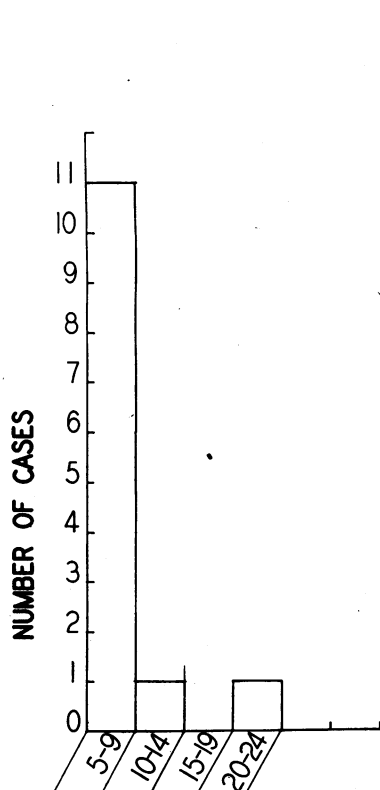
All patients were placed on the following special diet:

Milk: Only cooked.

Eggs: Only with cooking.

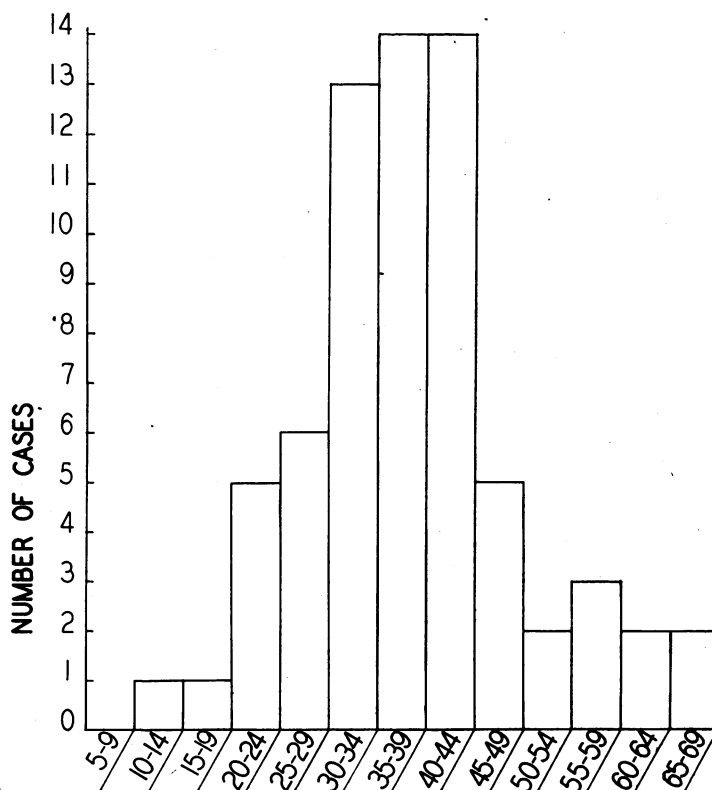
Meats: Tender cuts—avoid pork, ham, bacon, and very fat meats.

Vegetables: All cooked. Peas, green beans, asparagus, tomatoes, carrots, beets, baby lima beans, artichoke hearts, squash.



- FIG 1A -

- AVERAGE HEALING TIME IN DAYS -



- FIG 1B -

- AVERAGE HEALING TIME IN DAYS -

HEALING TIME OF 13 CASES OF PEPTIC ULCER TREATED WITH FRESH CABBAGE JUICE (FIG 1A) COMPARED TO 68 CASES FROM THE LITERATURE ON STANDARD TREATMENT (FIG 1B)

Potatoes: Cooked as desired. Avoid fried. Rice, noodles, spaghetti, macaroni may be substituted.

Cereals and Bread: All white cereals and finely milled dark breads and cereals.

Fats: Butter in moderation. Lard in moderation.

Fruits: Cooked or canned—peaches, pears, apples, cherries, apricots, strained orange juice or tomato juice.

Desserts: Jello, puddings, simple pie, fruits listed above, cake, ices. Avoid ice cream.

Beverages: Coffee in moderation. Tea in moderation. Postum. Fruit juices of allowed fruits.

Condiments: In moderation.

Sweets: Sugar, honey, clear syrups, jelly. No seeds or skins. No nuts.

Only foods on diet to be served patient.

Patient may have as much of above foods as desired.

Nourishments between meals are allowed including ONLY the foods listed above.

The purpose of this diet was to eliminate all fresh and uncooked foods and to serve the patient only food which had been heated. This type of diet was ordered to eliminate possible food sources of the anti-peptic ulcer factor, which is readily destroyed by heating.^{2, 5} Milk that had been heated only to the pasteurization point was not permitted, although recent animal experiments suggest that pasteurization destroys the anti-ulcer factor, at least in part. Patients were allowed food between meals as desired, in addition to three meals daily.

All patients were required to take at least a liter of fresh cabbage juice daily. This amount was based

upon the fact that a minimum of 2 gm. of fresh cabbage leaves or 4 cc. of juice daily had been shown during the summer of 1948 to be 100 per cent protective against histamin-induced peptic ulcers in guinea pigs weighing approximately 300 gm. As 6 gm. of leaves or 12 cc. of juice daily would protect approximately one kilogram of guinea pig, it was calculated on the basis of relative body weight that the amount of juice necessary to adequately supply a 60-kilogram patient with the anti-peptic ulcer factor would be about 720 cc. To allow for variability in body weights of patients and for other unknown variables, it was felt that a patient should receive more than this amount of juice, so that a liter per day was chosen as the standard dose. Occasionally a patient would take as little as 500 or 600 cc. daily for one or two days until he became accustomed to this rather unusual beverage. One patient, case 10, consistently drank at least 1,200 cc. daily. A daily record of the total amount of juice drunk was kept throughout the period of the experiment.

No selection of cabbage heads was carried out. The usual hospital supply was utilized. Only green cabbage was used. The cabbages were noticeably pale in color during the fall months compared to those obtained during the spring and summer. All of the cabbage head was used. A juice press was employed to obtain clear cabbage juice. Usually about 2 kg. of cabbage was fed into the press to obtain 1,000 cc. of juice in an operation of about

TABLE 1.—Effect of Fresh Cabbage Juice Therapy on the X-Ray Demonstration of Peptic Ulcer Craters in 13 Patients

Case No.	Age and Sex	Duration of Present Symptoms	X-Ray Findings Before Treatment	Cabbage Juice Therapy		Days Before Symptoms Subsided	X-Ray Findings After Treatment
				No. of Days	Total Amt.		
1*	54 F	2 mos.	Small gastrojejunal ulcer crater.....	7	7,000 cc.	3	No lesion found
2*	67 F	2 wks.	Small lesser curvature gastric ulcer crater.....	7	7,000 cc.	4	No lesion found
3	34 M	1 mo.	Moderate size postbulbar duodenal ulcer crater.....	7	7,000 cc.	3	No signs of ulcer
4	36 M	1 mo.	Large duodenal cap crater.....	6	5,500 cc.	2	No signs of ulcer
5	42 M	1 mo.	Large duodenal ulcer crater.....	8	8,000 cc.	3	No lesion found
6*	57 M	6 wks.	Small lesser curvature gastric ulcer crater.....	9	9,000 cc.	Asymptomatic time of therapy	No evidence of ulcer crater
7	53 M	3 mos.	Moderate sized duodenal ulcer crater.....	7	7,000 cc.	Asymptomatic time of therapy	No lesion found
8*	45 M	3 wks.	Large lesser curvature gastric ulcer.....	7	7,000 cc.	4	No lesion found
9	52 F	6 mos.	Large duodenal ulcer crater and cap deformity.....	8 23	6,000 cc. 13,500 cc.	2	Crater one-half former size No crater seen
10	72 M	2 mos.	Large duodenal ulcer crater and cap deformity.....	8	12,800 cc.	3	No crater found; cap deformity persists
11*	26 F	6 mos.	Small lesser curvature gastric ulcer.....	9	7,800 cc.	4	No lesion found
12*	40 M	6 wks.	Small prepyloric ulcer crater.....	6	6,000 cc.	Asymptomatic time of therapy	No sign of ulcer
13	52 M	2 mos.	Large postbulbar ulcer crater.....	9 14	8,000 cc. 13,000 cc.	6	Small ulcer crater persists No crater demonstrated

*Gastroscopic examination carried out before and after therapy.

20 minutes' duration, although a considerably higher yield of fluid could be obtained if small amounts of cabbage were fed into the press very slowly. As a rule fresh juice was prepared for each patient twice daily, at 10 a.m. and 2 p.m. As the addition of celery juice made the beverage more palatable, and it had been found to contain the anti-peptic ulcer factor, three of the last four patients treated received a mixture of 75 per cent cabbage juice and 25 per cent fresh celery (stalk and greens) juice.

All the patients except one not included in this series were able to take the cabbage juice successfully for the duration of the experiment. The total amount of juice received by each patient is shown in Table 1. About one-third of the patients developed mild abdominal distress and some constipation the second or third day of juice administration. These symptoms were relieved by giving milk of magnesia. Two patients omitted the cabbage juice for one day each while these symptoms were occurring. The juice was given to the patients in 200 cc. amounts five times a day. It was served about 10:30 a.m., at lunch, in mid-afternoon, at supper and in the early evening. It was kept in the ice box and served, well chilled, directly to the patient. Juice kept overnight was not palatable. Seasoning with salt and pepper and an addition of tomato juice was encouraged, as was the ingestion of crackers or other food along with the cabbage juice. It was not necessary to tube-feed the juice to any of the patients.

In addition to the x-ray examinations carried out to evaluate the results of cabbage juice therapy, gastroscopic examinations were performed, before and after treatment, on all of the six patients with gastric lesions. All of the gastroscopic studies with one exception were carried out by a single gastroscopist, Dr. Hugh Rose, Jr. The day that pain ceased was noted for each patient (see Table 1). A gastric analysis was performed in each case as part of the initial case study. Follow-up case studies were not carried out.

RESULTS OF EXPERIMENTAL THERAPY

Table 1 shows clearly the results obtained in treating 13 peptic ulcer patients with fresh cabbage juice. All showed rapid improvement, as measured by x-ray studies of crater healing time. In 11 of the 13 cases the craters disappeared within six to nine days. No cases were recorded by Cummings and co-workers⁷ as healing this rapidly. A comparison of results in their cases with those in ours is shown graphically in Figure 1. In one patient in our series, case 13, the crater took 14 days to "heal" (see Figure 2), and in one, case 9, 23 days. In both instances the healing time was much shorter than the average of 37 days reported in the literature. The average healing time for the seven cases of duodenal ulcer treated with cabbage juice was 10.4 days, compared with 37 days in cases from the literature. The average healing time for the six cases of gastric ulcer, including the patient with marginal ulcers, was only 7.3 days, compared with 42 days for those from the literature.

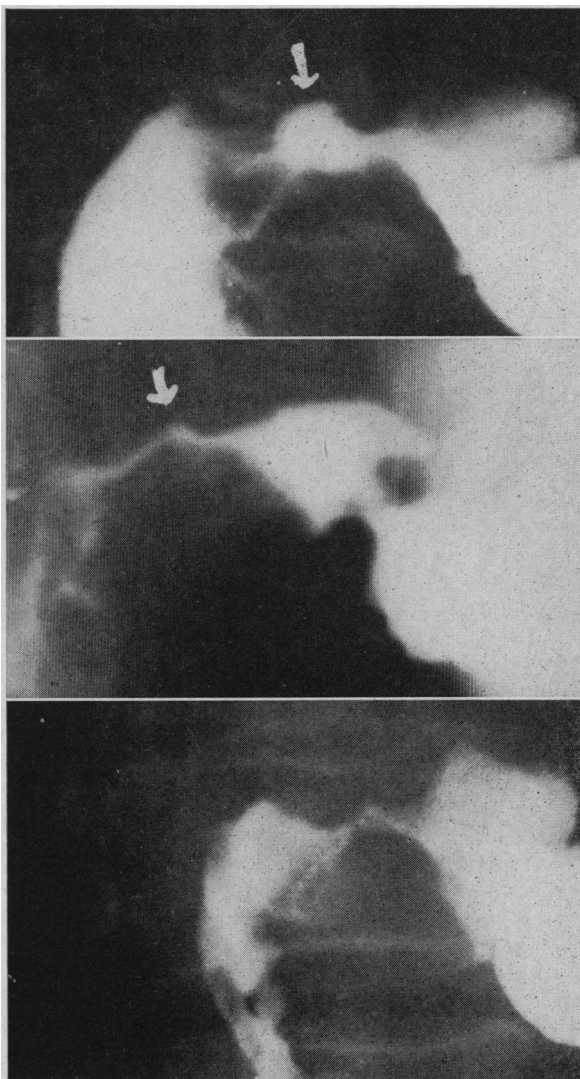


Figure 2.—Rapid healing of a large duodenal ulcer during the administration of fresh cabbage juice. (Top)—Large postbulbar crater before treatment. (Middle)—Marked reduction in size of crater after nine days of therapy. (Bottom)—Disappearance of crater after fourteen days of therapy.

The average healing time for the total of 13 cases of peptic ulcer treated with cabbage juice was nine days.

The results of gastroscopic examination proved even more dramatic in the six cases of gastric ulcers than the x-ray demonstration of rapid crater healing. In two of these patients, case 1 with three small gastrojejunal ulcers visualized through the gastroscope and case 11 in which two small gastric ulcers were seen on the lesser curvature of the stomach, the lesions appeared to be completely healed at the time of the second gastroscopic examination which followed treatment. In the other four cases typical healing lesions could still be identified after treatment but crater depression was either not discernible or so slight as to be almost indistinguishable. In Figure 3 a reproduction of the x-ray films of case 6

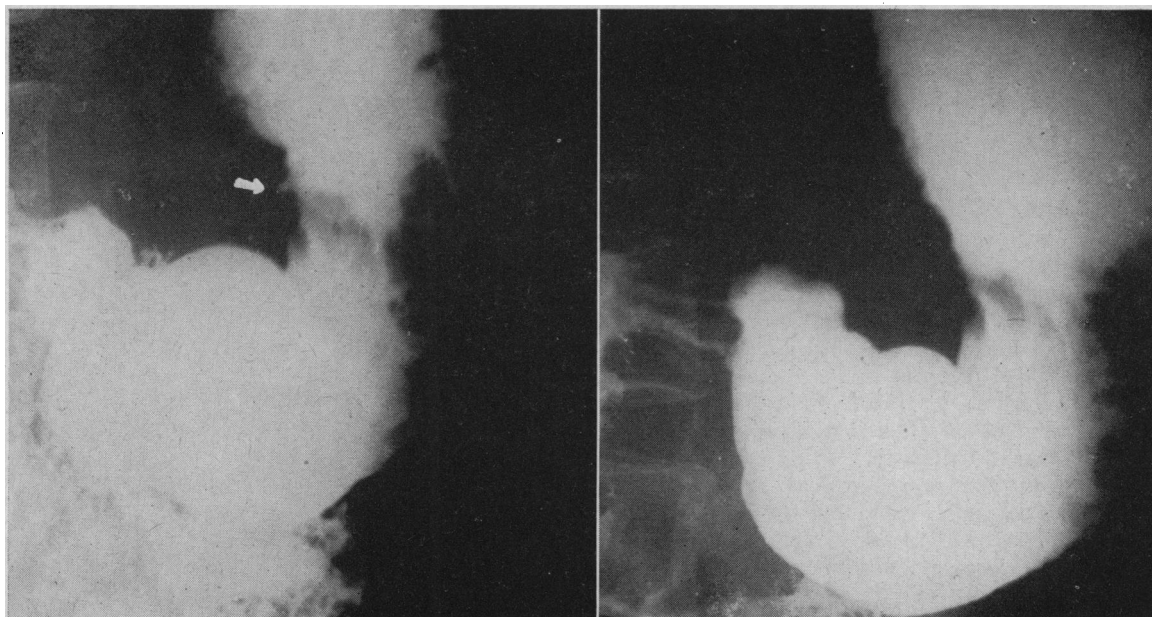


Figure 3.—Rapid healing of a small lesser curvature gastric ulcer. (Left)—Appearance of crater before cabbage juice therapy. (Right)—Disappearance of crater after nine days of therapy.

shows the presence of a gastric ulcer crater before treatment with cabbage juice and its absence after treatment. In this case the ulcer niche had persisted for six weeks without appreciable change while the patient was receiving a "standard type" of peptic ulcer regime. The gastroscopic examinations of this patient, as was the case with the other patients with gastric ulcers, not only confirmed the appearance of the crater as outlined by the x-ray films before the institution of therapy, but also demonstrated that after he had received 9,000 cc. of cabbage juice over a nine-day period, the crater had filled in nicely as part of the healing process of the peptic ulcer.

SIGNIFICANCE OF THE RESULTS OBTAINED

The rapid healing of peptic ulcer craters in 13 patients receiving fresh cabbage juice therapy is not considered adequate proof that cabbage contains an unidentified factor (Vitamin U) which apparently plays a specific role in healing of peptic ulcers. However, it indicates that such may be the case. The results in this small series of cases are sufficiently encouraging to warrant treating a large group of carefully controlled patients with the anti-ulcer factor. At present such a study must be purely on an experimental basis.

It is important to note that the cabbage is not the sole source of the anti-ulcer factor. It has been shown experimentally that it is present in varying concentration in a variety of fresh greens and cereal grasses as well as fresh milk, raw egg yolks, certain animal and vegetable fats and gastric mucosa.^{2, 3, 4, 5} It has not been identified as any one of the known vitamins or any food factor which has been isolated. Large doses of ascorbic acid are protective against histamin-induced peptic ulcers in guinea pigs,³ but

the relationship of Vitamin C and Vitamin U in this respect has not yet been worked out. Vitamin C is water soluble while Vitamin U is fat soluble.

The fact that the anti-peptic ulcer factor is readily destroyed by heat indicates that the preparation of food for human consumption by heating or cooking may completely destroy this factor. If this is so, it may become necessary to include certain raw foods in the diet of peptic ulcer patients, not only to promote the healing of ulcers which have already formed, but to prevent the development of lesions in the future. At present pasteurized or even raw milk cannot be relied upon alone to accomplish this purpose. Experimental studies which are going on at present strongly indicate that fresh greens, milk and eggs contain a great deal less of the anti-ulcer factor in the fall in California than they did in the spring and summer. It is noteworthy that there is a high seasonal incidence of peptic ulcer symptoms in the late fall in northern California.

Up to the present no extract or concentrate containing Vitamin U has been developed for clinical trial. However, during November 1948 a concentrate of cabbage fat* has completely protected ten guinea pigs from histamin-induced peptic ulcers when it was fed at the level of 100 mg. per day to a 300 gm. animal.

*Supplied by Viobin Corporation of Monticello, Illinois.

REFERENCES

1. Almquist, H. J.: Source and nature of gizzard factor, *J. Nutrition*, 13:339, 1937.
2. Cheney, Garnett: Prevention of histamin-induced peptic ulcers by diet. *Stanford Medical Bulletin*, 6:2.
3. Cheney, Garnett: Nature of the anti-peptic ulcer dietary factor. To be published.

4. Cheney, Garnett: Effect of diet and cinchopen on production of experimental gastric ulcers in chicks, *Proc. Soc. Exper. Biol. and Med.*, 45:190, 1940.

5. Cheney, Garnett: Cinchophen gastric ulcers in chicks, *Arch. Int. Med.*, 70:532-57 (Oct.), 1942.

6. Cheney, Garnett: Peptic ulcer and nutrition, *The Military Surgeon*, 95:6 (Dec.), 1944.

7. Cummings, G. M., Jr., Grossman, M. L., and Ivy, A. C.: A study of the time of "healing" of peptic ulcer in a series of 69 cases of duodenal and gastric craters, *Gastroenterology*, 7:2037, 1946.

8. Fanley, G. B., and Ivy, A. C.: The prevention of post-operative jejunal ulcers by diet and fundusectomy, *Surg., Gynec. & Obst.*, 63:717, 1936.

9. Gianelli, V. J., and Bellafiore, V.: Fundamental importance of diet in treatment of peptic ulcer in army general hospital, with special reference to vitamin U therapy, *M. Clin. North America*, 29:706-713 (May), 1945.

10. Pollard, H. M., Bachrach, W. H., and Block, M.: The rate of healing of gastric ulcers, *Gastroenterology*, 8:435-437, 1947.



Hemostasis With Absorbable Material in Operations on the Foot

A. GOTTLIEB, M.D., *Los Angeles*

THE smaller an operative wound area, the more difficult the control of capillary bleeding. Oozing of blood from cancellous bone after resection of an exostosis or partial removal of the condyle of a phalanx of a metatarsal bone has always been a difficult problem in operations on the foot. A similar problem is encountered in operations on soft tissues and in dissection of loose pieces of bone from connective tissue. The bleeding not only interferes with the surgeon's view, but forms tiny pools which hamper wound healing.

The bleeding capillaries may be too small to be caught and ligated, and if the oozing originates from cancellous bone the capillaries may be inaccessible for clamping and ligation. Pressure applied to the bleeding surface may help somewhat, and a pressure bandage after the wound is closed may control the minute hemorrhage. But these measures have only limited value; and, as to a compression bandage over a dressing, there is the disadvantage that it may become too tight and cause pain.

Oxidized cellulose gauze and absorbable gelatin sponges offer a very welcome solution to the problem. Either of these substances may be placed in the wound to stop bleeding and left there to be absorbed eventually by the tissues.

TECHNIQUE

A pledget of the proper size is cut from the material in bulk, placed on the bleeding surface and pressed down by the gloved finger covered with sterile gauze. It will stick to the wound and absorb the oozing blood. Left in place and the wound closed

over it, it will gradually be absorbed and disappear from the tissues.

In cases in which it is desirable to put thrombin or penicillin into the wound, this may be done by immersing the gelatin sponge pledget in a solution of either or both of these drugs before it is pressed into place and the wound closed over it. The thrombin solution used by the author is made by dissolving 1,500 units of thrombin powder in 15 cc. of normal saline solution. If an antibiotic is indicated, penicillin is added, 200 units or more to each cubic centimeter of the thrombin-saline solution.

The author has used oxidized cellulose gauze and absorbable gelatin sponges, in the manner described, in bunionectomy, arthrectomy, sesamoidectomy, calcaneal exostotomy and a variety of other operative procedures on the foot. In no case was delay in wound healing or other complication encountered.

SUMMARY

Oxidized cellulose gauze and absorbable gelatin sponges may be pressed into small operative wounds in the foot to control capillary ooze of blood that otherwise presents difficulties in such procedures.

The material may be left in place to be absorbed by the surrounding tissues after the wound is closed over it.

Pledgets of gelatin sponge soaked in solutions of thrombin or penicillin or both may be used to hold these drugs within a wound if use of them is indicated.

727 West Seventh Street.