
DIAGNOSTIC PROCEDURES IN GASTROENTEROLOGY

**With nurse's notes and supplements on instructions
to patients and dietary treatment**

Edited by

Charles H. Brown, M.D.

Head, Department of Gastroenterology
Cleveland Clinic Foundation
Cleveland, Ohio

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Gastric biopsy

Francis J. Owens, M.D.

EDITOR'S NOTE: We at Cleveland Clinic have used a suction type of biopsy, such as with the Rubin tube (in a blind biopsy) or with the Berry attachment to the Eder gastroscope, in our gastric biopsies. We have not used the Benedict operating gastroscope.

The suction type of gastric biopsy has certain disadvantages which must be recognized. Such a biopsy may be excellent for diffuse lesions of the stomach, such as gastritis, granulomatous lesions of the stomach, or sarcoidosis; suction biopsy is not very helpful in the diagnosis of neoplastic lesions of the stomach. Gastric carcinoma is usually so hard and fixed that a biopsy is not obtained by the suction method; the carcinoma is too hard to be "sucked" into the suction biopsy. Invariably, suction biopsy attempts in patients with carcinoma of the stomach results in "no tissue obtained" and should not be used in an attempt to diagnose malignant gastric lesions.

A systematic attempt to perform gastric biopsy was reported by Kenamore in 1940.³ Although at that time it was well known that small fragments of gastric mucosa might be obtained by gastric aspiration, Kenamore devised a forceps that was attached to a gastroscope. Benedict incorporated such a biopsy forceps in an "operating gastroscope."¹

Wood and associates⁷ and Tomenius⁵ introduced appliances for suction biopsy, based on a different concept. In these instruments the mucosa was sucked into an aperture and then sheared off tangentially by a biopsy knife. The Wood tube and the Tomenius tube each resembled an ordinary Ewald gastric evacuator tube. Later, the Tomenius instrument was incorporated in a gastroscope.⁶

Hancock and Shiner introduced for the Herman-Taylor gastroscope a suction type of biopsy attachment designed to slide down in front of the objective window so as to permit direct vision for biopsy.²

The Berry biopsy attachment for the Eder-Palmer gastroscope consists of a cylindrical, metal, capsular sheath on the end of a semirigid plastic and metal sheath. It slides onto the gastroscope when biopsy is desired but is easily removable. The sheath slides down partially covering the objective window so

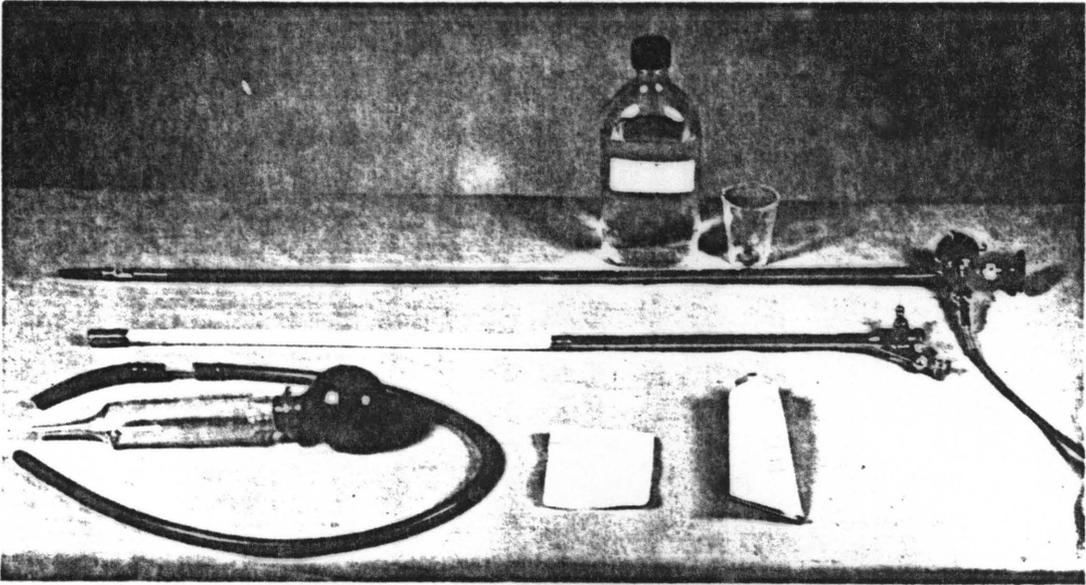


Fig. 21-1. Berry biopsy sheath lying in front of Eder-Palmer gastroscop. Tetracaine HCl topical anesthetic, lubricant. Asepto syringe and Ewald tube are also shown.

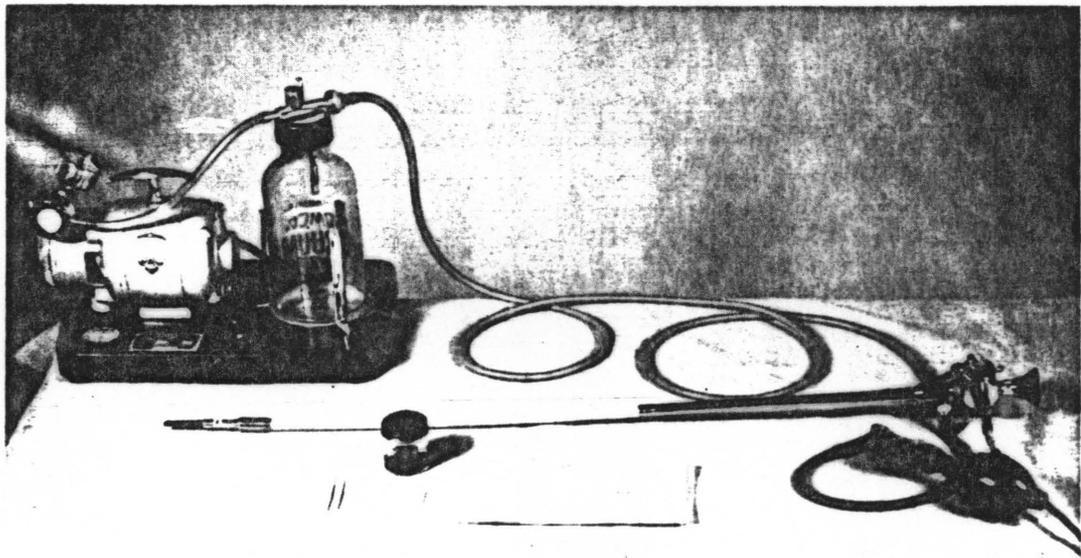


Fig. 21-2. Berry biopsy sheath with Eder-Palmer gastroscop ensheathed. Gomco suction machine, Zenker's fixative, toothpicks, filter paper and pathology data request are also shown.

that biopsy specimens can be taken with direct vision (Figs. 21-1 and 21-2). The use of the Berry biopsy instrument is described in this chapter.

The Hirschowitz fiberscope is supplied with a small biopsy forceps which can be passed through the air channel of the instrument. A small rubber nipple serves to prevent the escape of air. The forceps projects at a 45° angle from the gastroscop, in front of the viewing lens, and the biting tip is not

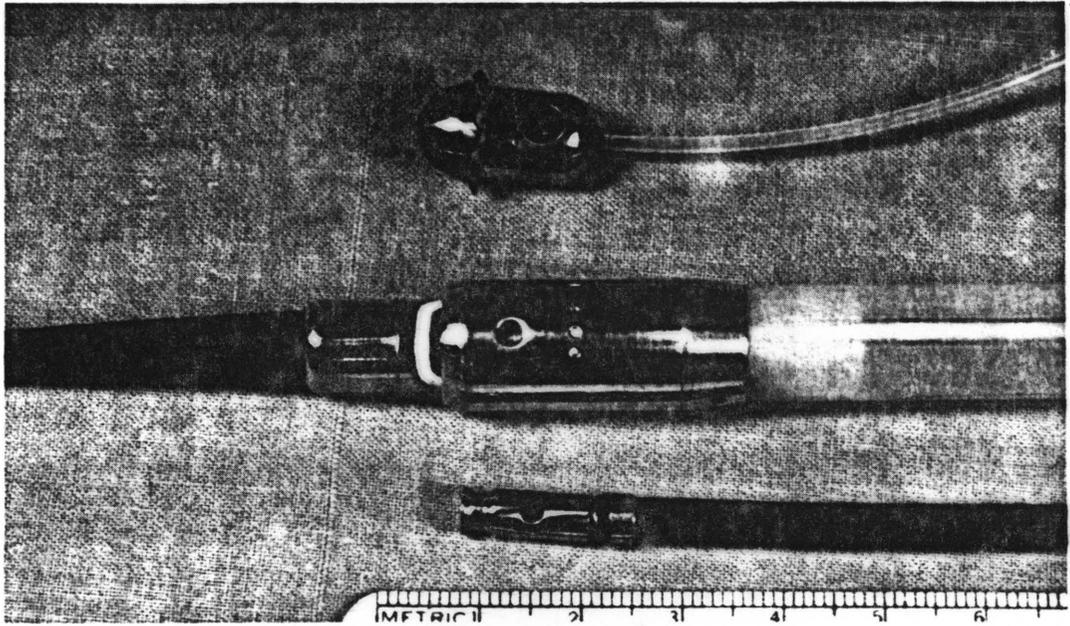


Fig. 21-3. Comparison of biopsy ports of Crosby capsule (top), Berry instrument (center), and Rubin multipurpose instrument (bottom).

visible if projected more than 2 or 3 cm. from the lens. Lateral motion of the forceps head is controlled by a knob at the proximal end, and the jaws are opened and closed by a conventional handle. To obtain a biopsy under direct vision, the gastroscope is maneuvered close to the lesion, the forceps tip advanced to the lesion, the jaws are opened, then closed on the bit of tissue, and the forceps withdrawn from the instrument. This is not easily accomplished successfully. The biopsy specimen is very small.

The Olympus GTB fiberscope has a biopsy forceps similar to that described for the Hirschowitz instrument but can be protruded at a greater angle (60°) from the gastroscope so that it remains in view for a greater distance from the instrument. This extends the range of the biopsy capability. The Machida gastroscope, biopsy model, has a device which adjusts the deflection angle of the biopsy forceps up to 90° .

INDICATIONS

Gastric biopsy is useful in the clinical evaluation of diffuse gastric mucosal abnormality such as the diffuse atrophy found in pernicious anemia and in differentiation of chronic gastritis from superficial, spreading neoplasms. Blind biopsy using the Wood type of tube is satisfactory in approaching this type of abnormality. The procedure may also be used in the evaluation of localized gastric mucosal lesions, sampling areas of involvement with a direct gastroscopic biopsy method.

Experimentally, the gastric biopsy may be used in evaluation of the effect upon the gastric mucosa of various procedures such as surgical operations and gastric cooling or freezing and of medications.

CONTRAINDICATIONS

Patients with bleeding diatheses might have dangerous hemorrhage after biopsy. Coagulation studies are not done unless the general history and physical examination suggest a hemorrhagic disorder. Acute severe gastritis might be aggravated, and an extremely atrophic stomach wall might be perforated by biopsy. Any contraindication to intubation, such as severe oropharyngeal, esophageal, or gastric disease, severe cardiac or pulmonary disease, or an acute abdominal condition, may constitute a relative or absolute contraindication to blind biopsy using the Wood type of tube. These situations require a specific evaluation and decision. Any contraindication to gastroscopy with the Wolf-Schindler type of gastroscope (see Chapter 16) is a contraindication to biopsy with the Berry biopsy instrument.⁴

VALUE

Roentgenologic evaluation of the stomach may raise a question of abnormality of the gastric mucosa which is not always settled by gastroscopy. In this situation, generalized processes are amenable to investigation by blind gastric biopsy.

Limitations imposed by the procedure involve the region in which biopsy is desired. Lesions in the proximal or the distal part of the stomach within the range of the tip of an Eder-Palmer gastroscope, specifically areas that could be brought into apposition to the window of the instrument when the stomach is collapsed as it is in the taking of the biopsy specimen, may be amenable to biopsy with the Berry instrument. Other regions, such as in the antrum or in the fornix of the stomach, may be reached with the Wood type of instrument or its modifications, either by maneuvering the tip of the tube into a circle back up into the fornix, or by passing it into the distal part of the antrum.

PREPARATION OF THE PATIENT

Overnight fasting is necessary. In the event of any obstruction of the outlet of the stomach, lavage is also required. No medications may be required for the blind biopsy using the various modifications of the Wood type of instruments, but are usually required for biopsy with the Berry attachment for the gastroscope. Sodium phenobarbital, 1 or 2 grains, may be given intramuscularly or meperidine, from 50 to 100 mg., may be given intravenously. Topically, tetracaine or lidocaine may be given by gargle or pharyngeal spray.

TECHNIQUE

Blind biopsy

The procedure described for biopsy of the small intestine is utilized for gastric biopsy with these differences: (1) The distance from the mouth to the biopsy site is from 42 cm. to 70 cm., depending on the area of biopsy site desired. Blind biopsy is possible within these limits. Fluoroscopy localizes the biopsy capsule to eliminate the curling of the tube, which may result in improper positioning above the stomach. (2) The suction pressures used for the Rubin and the Bolt-French tubes are from 7 to 10 inches of mercury.

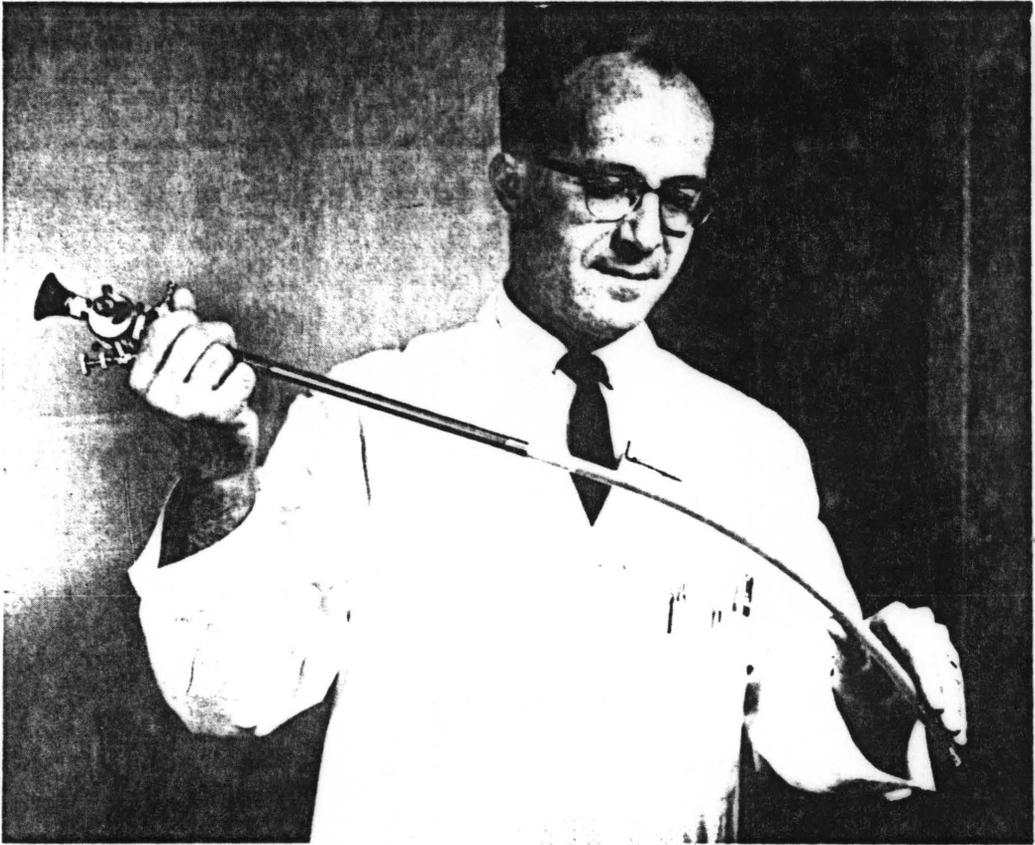


Fig. 21-4. Demonstration of the unimpaired flexibility of the Berry biopsy attachment to the Eder-Palmer gastroscope.

Berry biopsy instrument

The assembled Berry biopsy attachment is slipped onto the Eder-Palmer gastroscope (Fig. 21-4), in accordance with the specific directions supplied with the instrument by the manufacturer. Figure 21-5 shows the instrument and its parts, and the following discussion refers to this illustration.

At the Cleveland Clinic we perform diagnostic gastroscopy with the fiberoptic gastroscope (Hirschowitz fiberscope) as a standard procedure. If a biopsy is desired, the fiberscope is removed and then the Berry biopsy instrument, with the Eder-Palmer gastroscope ensheathed, is passed and the biopsy specimen is taken.

Before the Berry biopsy attachment is slipped onto the Eder-Palmer gastroscope, the locknut (D) is loosened by counterclockwise turns. The Eder-Palmer gastroscope is then slipped down the sheath until the slotted bushing (C) straddles the indicating pin of the gastroscope. The locknut is tightened by clockwise turns so that no more than 1 cm. of movement of the sheath along the gastroscope is possible.

The inflation bulb of the gastroscope is attached to the inflation connector (E₁) instead of to the usual air connection of the gastroscope. The suction

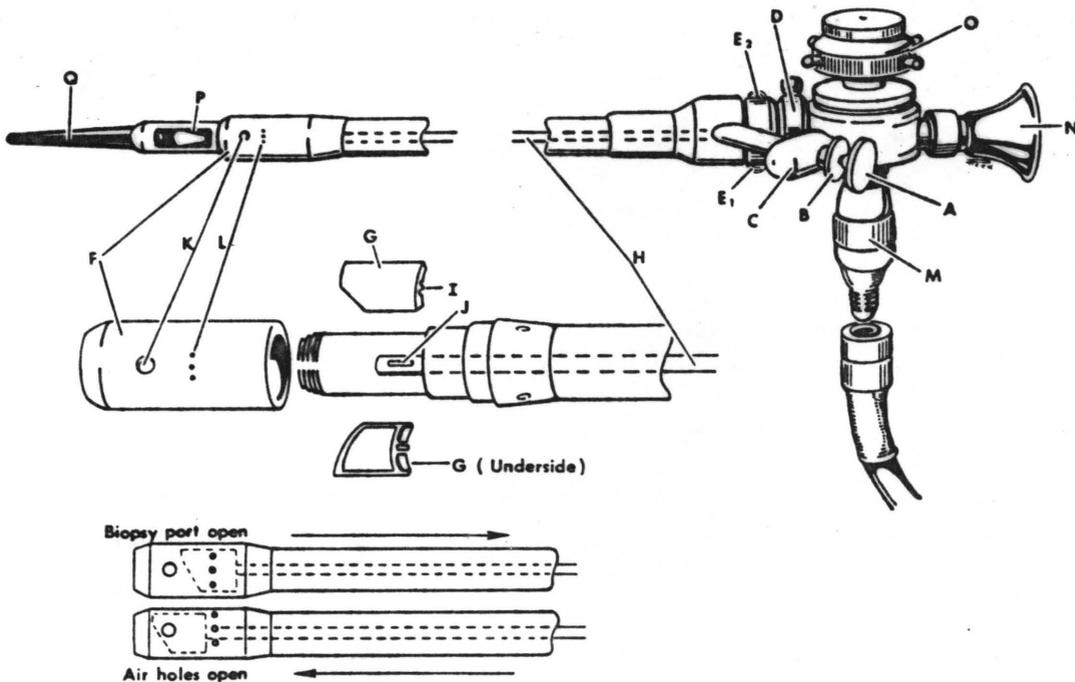


Fig. 21-5. Berry biopsy instrument, schematic drawing. A, Cutting plunger; B, flanged bushing; C, slotted bushing; D, locknut; E₁ inflation connector; E₂, suction connector; F, cutting head; G, biopsy knife; H, cutting wire; I, knife key; J, cutting wire key slot; K, biopsy port; L, air holes. Eder-Palmer gastroscope parts also shown include: M, light switch; N, eyepiece; O, remote control handle; P, objective window; Q, tip.

tube, leading from a suction machine such as the Gomco suction apparatus, is attached to the suction connector (E₂). The suction tubing must be stiff enough to tolerate the 15 inches of negative pressure required for an adequate biopsy specimen. Applying a finger to the biopsy port (K) gives some idea of the adequacy of the suction. If suction is not adequate, wax may be applied at the margin between the cutting head (F) and the gastroscope to prevent an air leak at this point.

After the instrument is assembled, the biopsy knife (G) is moved several times to ensure proper assembly. As the cutting wire (H) is maintained between the gastroscope and the sheath, the test cannot be satisfactorily done until the instrument is assembled. The cutting plunger (A), which is attached to the cutting wire, is depressed toward the flanged bushing (B) to move the biopsy knife which is attached to the other end of the cutting wire. As the biopsy port is closed, the air holes (L) are opened, permitting air insufflation of the stomach.

The gastroscope, equipped with the Berry biopsy attachment, is passed in the manner recommended for the Wolf-Schindler gastroscope.⁵ During inspection of the stomach, when insufflation is necessary, the inflation connector to which the inflation bulb is attached must be directly opposite, that is, at 180 degrees from knobs A and C.

In order to carry out gastric biopsy, the air in the stomach must be evacu-

ated. When the area for biopsy is visualized, the ring containing the inflation and suction connectors (E_1 and E_2) is turned so that E_2 is directly opposite the knobs A and C. Then the suction is turned on to evacuate the air from the stomach, causing the mucosa to collapse toward the biopsy port. Since several folds may converge toward the biopsy port at the same time, one must maneuver the instrument in order to be sure to obtain the proper site.

In addition to being rotated on its long axis and being moved in and out, the distal tip of the Eder-Palmer instrument may also be moved back and forth by appropriate manipulation of the remote control handle (O) on the head of the instrument. There is some limitation of this movement by the biopsy sheath, but it is not prevented entirely and therefore may be helpful in selecting biopsy sites. The Eder-Palmer gastroscope with the Bernstein attachment also permits scrutiny of the mucosa when it is close to the objective window of the instrument.

Two methods of apposing the biopsy port to the biopsy site are possible. Either the instrument can be slid down the gastroscope 1 cm. so that the tip of the instrument overlies the objective window (P) partially, or the entire instrument may be passed inward the same distance. The latter method prevents rotation of the biopsy sheath upon the gastroscope when the slotted bushing (C) no longer straddles the indicator pin. However, if a biopsy site is chosen from the lower portion of the stomach, passing of the entire instrument may cause the tip (Q) to impinge upon the lower pole of the stomach, which maneuver will move the entire wall somewhat and change the relationship of the biopsy port to the area of biopsy desired.

To take the biopsy specimen, the biopsy port (K) is opened by drawing the cutting plunger (A) away from the flanged bushing (B) as far as it will go. The suction is then applied up to 15 inches of negative pressure and maintained at that pressure for a few seconds. Observation through the gastroscope should disclose apposition of the mucosa, but long maintenance of suction at this pressure results in severe engorgement of the biopsy specimen. The tissue is actually taken by depressing knob A as far as it will go toward B, cutting off the tuft of mucosa drawn into the biopsy aperture. The suction may then be discontinued.

The inflation connector (E_1) is again turned to a point directly opposite knobs A and C, and insufflation of the stomach can be accomplished. One must be careful not to open the biopsy port at this time, or the specimen may be blown out into the stomach and lost.

The previous biopsy site may now be observed, and further biopsies in other areas may be accomplished. Two or three biopsy specimens are readily taken, but with more than this number the capsule chamber is likely to be overfilled.

At the completion of the gastroscopic observations and desired biopsies, the instrument is withdrawn and the locknut (D) at the head of the biopsy attachment is loosened to permit removal of the sheath from the gastroscope. The cutting head (F) is then unscrewed from the metal tip of the biopsy sheath. This procedure should be performed over a soft sheet so as to catch the knife blade or the biopsy specimens if these should drop. Avoid using

gauze around or under the specimen which can be damaged or torn by the threads.

The specimens are oriented on the fingertip, with the serosa side down, and then applied to moistened filter paper with the mucosa flat on the filter paper. Proper positioning of the specimen is necessary to permit the pathologist to section it perpendicular to the mucosal surface. The filter paper with biopsy specimen attached is put into fixative immediately and is sent to the pathologist. We have routinely used Zenker's solution for fixation of the biopsy specimens.

The biopsy specimens are usually from 1.5 to 2 mm. in diameter and about 0.5 mm. in depth. This thickness includes the full glandular layer, as is indicated by the inclusion of the muscularis mucosae in most specimens.

POSTPROCEDURE PRECAUTIONS

After the patient has undergone gastric biopsy, he should be observed closely for three or four hours in regard to possible complications. Bleeding and perforation are potential complications although they rarely occur. Repeated checking of the vital signs hardly seems necessary but may be reassuring to the patient and the operator at the conclusion of the period of observation. If nausea, weakness, or pain occurred, intensive examination would be indicated. Postbiopsy ulceration of the stomach is a theoretic possibility.

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