Family Practice Grand Rounds

Upper Gastrointestinal Bleeding in the Elderly

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DR. JIM WILSON *(Associate Professor, Department of Family Practice)*: Our focus this morning is on hemorrhage in the upper gastrointestinal tract in an elderly patient, centering on a patient who was hospitalized recently on the family practice service with massive upper gastrointestinal bleeding (UGIB) secondary to duodenal ulcers. We will review some epidemiological data on this problem in the elderly that was gathered from recent literature, and we will also discuss its management, especially with reference to fiberoptic esophagogastroduodenoscopy (EGD).

DR. EDWIN POWELL *(Second-year family practice resident)*: Admitted to the University of South Alabama Medical Center for the first time, this 72-year-old white retired grandfather from Mobile had been well until one week prior to admission, when he developed vague, viral-like symptoms and signs, including nausea, vomiting, and occasional diarrhea. During that time, he noticed one episode of hematochezia and subsequent melena. The patient also reported a 5-lb weight loss over the last two to three months and recently had become anorexic. He denied any changes in daily bowel habits or consistency of stools. He also denied a history of peptic ulcer disease. He was seen at the Family Practice Center on the day of admission.

The patient stated that he had been healthy most of his life. He had a tonsillectomy at the age of 16 years, but had not seen a physician regularly since. His last visit to a physician had occurred several years prior to admission. He was taking no prescribed medication and had taken no over-the-counter medication on a regular basis. He was allergic only to tetanus toxoid. His family history revealed that his mother had a history of pseudodiverticulosis coli and died at age 82 of congestive heart failure. His father had diabetes and died of a stroke. The patient gave a smoking history of greater than 50 pack-years and claimed only occasional ethanol use. His review of systems was noncontributory.

On physical examination he was noted to be a thin, frail-looking man in no acute distress who appeared to be his stated age. His temperature was

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97° F, pulse was 105 beats/min, respirations were 12/min, blood pressure was 100/60 mmHg without postural changes. Examination of the head, ears, eyes, nose, and throat yielded benign results except that the mucous membranes were pale. Examination of the cardiovascular and respiratory systems was normal and the abdominal examination was unremarkable. Rectal examination revealed an enlarged prostate and black stool, which was positive for occult blood. There were no masses in the rectum. The remainder of the physical examination was unremarkable.

Admission electrocardiogram and chest roentgenogram were within normal limits. Admission complete blood count revealed a hemoglobin level of 7.9 g/dL, hematocrit of 23 percent, and a normal white cell count and differential. The only blood chemistry abnormalities were alkaline phosphatase, which was elevated to 471 U/L, and gamma-glutamyltranspeptidase elevated to 294 U/L. The initial diagnostic impression was UGIB probably secondary to peptic ulcer disease, but gastrointestinal neoplasm was also considered. Upon admission the patient was given a transfusion with two units of packed cells. On the morning following admission an upper gastrointestinal series showed multiple antral ulcers. Later that same day the patient was given another two units of packed red blood cells. The following day EGD revealed active duodenal peptic ulcer disease and marked pyloroduodenal deformity with partial obstruction. Gastric acid analysis and serum gastrin determinations were obtained and later were reported as normal. Antacid and cimetidine therapy was recommended.

The patient's condition stabilized until the sixth hospital day. At morning rounds the nurses mentioned that he had fallen earlier that morning in his room. He was noted to be less talkative and less alert than usual. He was found to be hypotensive with a blood pressure of 80/50 mmHg. A hematocrit determination was 17 percent. He was transferred to the medical intensive care unit, transfused with more blood, and monitored hemodynamically using a Swan-Ganz catheter. He was transferred to the surgery service with plans for operative intervention as soon as his condition was stabilized.

At operation an exploratory celiotomy with truncal vagotomy, antrectomy, and Billroth II gastrojejunostomy was performed. During the procedure, periodic hypotension was manifest, but responded well to fluid administration. Incidental splenectomy was required because of intraoperative trauma, and generalized tissue friability was observed during the operation.

In spite of these difficulties the immediate postoperative course was uneventful, and a water-soluble contrast upper gastrointestinal series on the fourth postoperative day showed no extravasation from the anastomosis. However, the drain in the subhepatic space continued to have greater than expected amounts of bilious drainage, and a duodenocutaneous fistula was diagnosed on the ninth postoperative day. The fistula was the major factor that prolonged this patient's hospitalization. Total parenteral nutrition was instituted early in the postoperative course and was continued until the patient's oral intake was adequate and the fistula healed. He was transferred from the surgical intensive care unit to the floor on the 12th postoperative day.

On the 47th hospital day he was discharged to an extended-care facility to recuperate for another two weeks. Following this he was discharged to the home of his daughter, where his recovery has been gradual but steady. After several months he has regained his prehospital status.

DR. WILSON: Upper gastrointestinal bleeding is a commonly encountered problem in clinical practice. Although technological advances have improved our ability to monitor patients and to provide medical and surgical intensive care, overall mortality, reported at approximately 10 percent, has remained unchanged. Why should this be so? Has the condition changed or has the patient population changed?

In England, Schiller et al[1] studied during a 15-year period 2,149 emergency admissions to hospitals due to hematemesis or melena. During that time no major changes were noted in the sex ratio, age distribution, or diagnostic categories encountered. A number of factors, however, including the age of the patient and the underlying diagnosis, affected the patient's prognosis. The mortality rate remained unchanged during the study period.

In another study reported from England, Allan and Dykes[2] reviewed a series of articles on UGIB reported in the European literature since 1900. A striking and steady increase in the proportion of older patients was noted in these studies. In addi-

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Table 1. Clinical Prognostic Factors in Upper Gastrointestinal Bleeding From the National American Society of Gastrointestinal Endoscopy Survey of Patients Aged 2 to 96 Years (n = 2,225)

Mortality	Percentage
Overall	10.8
Patients less than 60 years	8.7
Patients greater than 60 years	13.4
Patients who bled before admission	7.1
Patients who bled during hospitalization	13.4
Patients with clear nasogastric aspirate and brown stools	8.0
Patients with red nasogastric aspirate and red blood in stools	30.0

From Silverstein et al[3]

Table 2. Endoscopic Findings in 2,097 Patients From the National American Society of Gastrointestinal Endoscopy Survey*

Finding	Percentage
Gastric erosion	29.6
Duodenal ulcer	22.8
Gastric ulcer	21.9
Varices	15.4
Esophagitis	12.8
Erosive duodenitis	9.1
Mallory-Weiss syndrome	8.0
Other	15.6

*Some patients had more than one type of lesion
From Silverstein et al[3]

tion, these authors conducted a prospective study of 300 patients admitted for hematemesis or melena. They found that the risk for developing a hemorrhage from the upper gastrointestinal tract was greater for the older age group (60 years and older), and that mortality was greater in the older population (4 deaths in 157 patients younger than 60 years vs 25 deaths in 143 patients over 60 years).

In the United States a study was recently conducted by the American Society of Gastrointestinal Endoscopy (ASGE).[3] From May 1978 through October 1979, 269 members of that organization were surveyed and submitted information on at least five consecutive patients referred to them for evaluation of UGIB. A large volume of data on 2,225 patients was collected, some of which is shown in Table 1. Mortality for patients older than 60 years was significantly higher than for patients younger than 60 years. A dramatic increase in mortality was also noted as the number of disease categories per patient increased. Congestive heart failure and cardiac arrhythmias were associated with increased mortality, whereas hypertension and angina were not. Encephalopathy, stroke, liver disease, renal disease, chronic obstructive pulmonary disease, and pneumonia were also associated with increased mortality. A listing of the diagnoses found at EGD and frequencies of each are shown in Table 2.

The ASGE data were collected on patients of all age groups. In searching the literature, only a few studies of UGIB dealing specifically with the elderly were discovered. Antler and colleagues[4] prospectively evaluated 136 consecutive patients with UGIB during July 1976 and October 1978. For purposes of comparison, this group of patients was divided into three age groups: young (23 to 34 years), middle aged (40 to 54 years), and elderly (55 years and older). The site of bleeding was determined by EGD. Among the differences noted were the more common occurrence of peptic ulcer disease in the group of elderly patients (duodenal ulcer was twice as common in the elderly compared with the young) and the more common occurrence of hemorrhagic gastritis in the group of young patients. Although the mortality rate for the older group of patients was substantially higher, the difference was not statistically significant. Mortality rates with respect to the bleeding site also revealed some interesting differences. For example, there was a 41 percent mortality rate among the patients in the elderly group who had gastric ulcer, where-

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as in the younger population the mortality rate for this condition was only 14 percent. Hemorrhagic gastritis in the young group had a mortality rate of 35 percent, whereas in the elderly the mortality rate for this condition was only 20 percent. In this study, however, the numbers were relatively small, and no statistically significant differences were noted.

Chang et al[5] reported an analysis of UGIB in 66 patients between the ages of 60 and 90 years, and in France Lamy et al[6] reported a similar study involving 165 patients aged 65 years or older. Although a greater frequency of portal hypertension was found in the patients from France (23 percent), these two groups of elderly patients were similar with respect to the high frequency of the diagnosis of peptic ulcer disease in each (71 percent and 44 percent, respectively).

The mortality rate in UGIB has not decreased during the past 40 years despite many technological advances. One of the most important has been the development and refinement of the fiberoptic endoscope. In recent years many clinicians and investigators have advocated an early, aggressive approach to the diagnosis and management of UGIB. In such an approach the use of the endoscope plays a prominent role. Many have argued that aggressive treatment results in better treatment outcomes. Others have refuted such arguments. Early EGD does yield a correct diagnosis more frequently than other techniques, but this does not seem to significantly affect the overall management or the eventual outcome of the acute bleeding episode.[7]

DR. CHARLES RODNING *(Assistant Professor, Departments of Surgery and Anatomy)*: I think Dr. Wilson has clearly identified the gravity of the problem of acute upper gastrointestinal bleeding in a patient of advanced age. My goal is to discuss the diagnostic evaluation and the nonoperative therapeutic intervention available to manage patients with such problems. In my opinion, the mainstay of diagnostic evaluation is esophagogastroduodenoscopy. During the past two decades the flexible fiberoptic endoscope, employing the physical principle of light transmitted along fiberoptic bundles, has been used extensively in clinical care. With the endoscope it is also possible to insufflate air and aspirate liquid from the upper gastrointestinal tract, which is important

in obtaining adequate visualization. In addition, such diagnostic instruments as biopsy forceps, cytologic brushes, and snares can be inserted through the instrument to perform various diagnostic and therapeutic procedures. EGD can be performed in almost any patient; however, it does require a cooperative patient, and written consent must be obtained, since it is an invasive procedure. The patient must be hemodynamically stable before endoscopy can be performed, since it is necessary to administer narcotic and soporific medications to achieve adequate relaxation and sedation. A knowledgeable assistant must be available to administer supplemental medications and to assist with various maneuvers. With the endoscope the region from the oral cavity to the fourth part of the duodenum can routinely be visualized, and a variety of pathologic entities, such as hiatal hernia, esophageal varices, foreign bodies, neoplasia, and peptic ulcers, are readily identifiable using this technique. In addition to the diagnostic capability, the endoscope is useful for performing several therapeutic procedures, such as the use of electrocoagulation to control ulcer-induced hemorrhage, extraction of foreign bodies, and injection of sclerosing agents into esophageal varices. The morbidity and mortality associated with EGD is negligible.

Does emergency EGD produce better results in the management of acute UGIB? Patients with vigorous hemorrhage are most likely to require emergency surgery; therefore, early identification of the bleeding site will be most helpful to the surgeon in planning and performing additional therapeutic intervention. Also, early EGD is extremely beneficial to the surgeon in prescribing appropriate therapy.

Sugawa et al[8] retrospectively analyzed the early therapeutic results associated with EGD in 183 patients. This procedure was successful in 97 percent of those patients, but was impossible or unsatisfactory in 3 percent for such reasons as a lack of patient cooperation, acute alcohol intoxication, massive hemorrhage precluding adequate visualization, or hemodynamic instability. The most common diagnoses were similar to those mentioned by Dr. Wilson. Another important observation was the identification of more than one bleeding site in more than one half of the patients investigated. This information is important and desirable for the surgeon when planning operative intervention, since it may significantly alter the therapeutic approach.

The diagnostic accuracy of EGD has been shown to exceed that of radiography. Allen et al[9] studied 260 patients who underwent EGD and reported an accuracy greater than 90 percent; the rate of accuracy using upper gastrointestinal radiography was approximately 30 percent. If endoscopy was delayed 48 hours or longer, the ability to make a positive diagnosis was substantially reduced, presumably because of the remarkable regenerative capacity of the gastrointestinal epithelium.

Some investigators, however, have refuted the argument for early EGD. Sandlow et al[10] prospectively evaluated 150 patients in whom UGIB was aggressively managed with early EGD and radiography. They observed an overall mortality rate of 7.5 percent of the patients who were aggressively managed compared with 8.5 percent of conservatively managed patients. Consequently, they argued that early EGD was not necessary. They also observed that continuous and recurrent hemorrhage was more frequent in the patients who underwent this procedure on an emergency basis, that emergency surgery was required more often, and that the hospitalization was more protracted. My interpretation of those data is that the more aggressively managed patients were more profoundly ill than the conservatively managed group. This is supported by examining the overall mortality of patients in that study. The operative mortality for the aggressively managed patient was 16 percent, whereas the operative mortality of the conservatively managed patient population who ultimately required operation was 40 percent. Therefore, I would conclude that their argument against early EGD was not supported.

Dronfield et al,[11] who also refuted the need for early EGD, prospectively analyzed 318 patients who were divided into a group receiving this procedure early and another group receiving radiography. The demographic data of the two groups of patients were similar, although the authors did not indicate the exact hemoglobin levels or the number of transfusions required by the patients in either group. The number of patients investigated early in their hospitalization was similar, and the diagnostic accuracy of EGD exceeded that of radiography. In a number of examinations the

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bleeding site could not be precisely determined, but this was comparable in both groups. The number of patients undergoing surgery, the mortality rates, and the duration of hospitalization were also similar in the two groups. On the basis of their analysis these authors concluded that early EGD was not mandatory and not efficacious. A criticism of their analysis, in an otherwise well-designed study, is that they did not precisely define the magnitude of the hemorrhage. The number of transfusions required or the degree of hemorrhage was not specified. I would presume that most of the patients experienced slight to moderate hemorrhage. In the context of the magnitude of hemorrhage, two other papers are relevant. Hellers and Ihre[12] evaluated severely hemorrhaging patients, comparing aggressive management (EGD, radiography, intensive care, electrocoagulative therapy, and early surgical intervention) with conservative management. Diagnostic accuracy was greater with the aggressive approach, and surgery within the first 48 hours occurred more frequently. Patients managed conservatively required an average 17 pints of blood vs 7 pints per patient in the other group. Surgical mortality was 47 percent in the conservatively managed patients and 11 percent in the aggressively managed patients. The authors argued that aggressive management of patients with severe UGIB substantially decreased morbidity and mortality. Himal et al[13] reported similar results. Mortality in a group of patients requiring less than 6 units of blood in a 24-hour period was 2.1 percent, but if transfusion requirements were greater than 10 units in a 24-hour period, the mortality rate was almost 50 percent. These authors also argued that multimodality intervention substantially reduced morbidity and mortality.

In addition to antacid and cimetidine therapy for the treatment of UGIB, there are other therapeutic maneuvers that should be considered prior to EGD and surgery. One effective means of evacuating the stomach before diagnostic evaluation or therapeutic intervention is a technique described by Atkenson and Nyhus[14] employing the insertion of an 18 F Levine tube through the nose and a 24 F Harris tube through the nose or by mouth for the instillation of an iced-saline solution and simultaneous gravity syphonage. This is an extremely effective method for evacuating blood from the gas-

tric lumen because it permits contraction of the stomach and may be effective in eliminating ongoing hemorrhage from this region.

Douglass[15] advocated the use of intraperitoneal or intraluminal instillation of levarterenol bitartrate in patients with UGIB. This was administered in a nonrandom and uncontrolled fashion in an attempt to control UGIB in a group of desperately ill patients with widely disseminated malignancies. Levarterenol bitartrate (16 mg) in 200 mL of isotonic saline was instilled by nasogastric tube into the gastric lumen, which was aspirated after 15 minutes and repeated two to four times until the bleeding had ceased. This technique was successful in controlling UGIB in this group of patients.

Papp[16] reviewed a series of 4,000 patients who underwent EGD over a five-year period. Massive hemorrhage was noted in 245 of those patients. In 38 patients active hemorrhage was noted prior to the procedure, and endoscopic electrocoagulation was 95 percent effective in achieving immediate cessation of hemorrhage. A similar experience was noted by Gaisford,[17] who observed a 97 percent success rate in achieving hemostasis within one or two sessions utilizing electrocoagulation techniques. It is difficult to categorically attribute causality between this technique and cessation of hemorrhage, since many other therapeutic maneuvers were used that may have contributed to the high success rate; nevertheless, it is certainly a technique that is available, and the data suggest it may be very effective.

The use of angiography to demonstrate the site of hemorrhage, to delineate vascular anatomy, and to permit infusion of embolic material or vasoconstrictive agents is another diagnostic and therapeutic option. Goldman et al[18] and Katzen et al[19] reported that injection of Gelfoam powder, Gelfoam sponge, or isobutyl-2-cyanoacrylate were effective in achieving occlusion of major vessels responsible for UGIB.

DR. MAX H. BERNS *(Associate Professor, Department of Family Practice)*: What about the use of endoscopy in the elderly who have many diseases?

DR. RODNING: It is even more important in that context to arrive at an early definitive diagnosis. When the homeostatic capabilities of a patient are compromised, as in the elderly, ongoing hemorrhage is poorly tolerated. The necessity of being aggressive from both a diagnostic and a therapeutic perspective is well substantiated.[12,13] If the patient is cooperative, the stomach must be evacuated of all blood, and the patient must be hemodynamically stable before this diagnostic procedure is performed. I would argue even more vigorously for the use of early EGD in the elderly patient with UGIB.

DR. JOSEPH TRONCALE *(Assistant Professor, Department of Family Practice)*: Once endoscopy is performed and you find severe variceal bleeding, what is the treatment of choice?

DR. RODNING: The immediate control of UGIB secondary to esophageal varices can be accomplished by the insertion of a multiple-lumen tube (Sengstaken-Blakemore, Edlich-Leonard, Linton-Nachlas, etc) to provide tamponade of the esophagogastric region.[20-22] In addition, the systemic intravenous infusion of vasopressin, which decreases portal venous pressure by 30 percent, can be effective in controlling hemorrhage secondary to portal venous hypertension.[23-25] These maneuvers are employed in addition to blood component therapy and replacement of extracellular fluid volume. Once the patient has been hemodynamically stabilized and the hemorrhage has ceased, additional therapeutic intervention is determined by the patient's status and course. If the patient has evidence of hepatocellular dysfunction, I would favor the use of sclerotherapy, injecting sclerosing agents around the esophagogastric varices as a temporizing measure to control hemorrhage.[26-28] If the patient's hepatocellular function can be improved substantially in the course of days to weeks, then consideration must be given to the use of a portosystemic shunt for more definitive control of the portal hypertension.[29]

DR. WOODROW POLEWODA *(Family Physician)*: How do you account for the friability of the tissues other than his advanced age?

DR. WILSON: The patient's nutritional status was poor prior to hospitalization. This elderly man had been living alone and eating when and what he wanted. He had been anorexic and had lost weight prior to admission. I believe that the use of total parenteral nutrition, which this patient received, was one of the most important aspects of his recovery. Because of the duodenocutaneous fistula that developed, it was necessary to restrict oral alimentation for most of his hospital stay.

DR. RODNING: I agree with that assessment. I

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think the patient was profoundly catabolic at the time he was admitted, and we were operating upon him under emergency circumstances. We did not have the opportunity to improve his nutritional status prior to surgery.

DR. GORDON E. CARROLL *(Family Physician)*: Could you comment on the choice of the operative procedure? Why was that particular choice made?

DR. RODNING: The patient had two problems identified before and during the operation, namely, acute massive UGIB and partial gastric outlet obstruction as a consequence of acute and chronic peptic ulcer disease. Truncal vagotomy with some type of decompressive procedure—pyloroplasty, gastrojejunostomy, or antrectomy with gastrojejunostomy—was considered.[30,31] Significant pyloroantral deformity precluded the technical performance of a pyloroplasty. Considering this patient's status at the time of surgery, one could argue in favor of a gastrojejunostomy. The surgical team concluded that this patient's peptic ulcer diathesis was significant, and elimination of the gastrin-secreting portion of the stomach was therefore desirable. Consequently, an antrectomy and gastrojejunostomy were performed.

DR. WILSON: If there are no further questions, I would like to close by thanking you for your participation.

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