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Discussion

Dr. David B. Hinshaw (Loma Linda): This type of work is predicated on the ready availability of extremely competent angiographers who are interested in working closely with surgeons. In our experience the benefits of "super" selective visceral angiography in acute gastrointestinal bleeding come under three headings. First, it has been extremely helpful in the diagnosis and localization of obscure gastrointestinal bleeding. Second, the precise localization of bleeding points as a guide to the surgeon—for example, to differentiate between bleeding from a peptic ulcer and bleeding esophageal varices in the same patient—or perhaps in localizing a specific site of hemorrhage in the colon. Third, there is an opportunity to control the acute bleeding by the local infusion of vasoconstrictive drugs.

The control of acute bleeding with the localized vasoconstrictive drugs (usually Pitressin) has been especially useful in very poor risk patients, some of whom have been completely controlled and others who have been controlled sufficiently long to improve their chances of successful operative treatment. Along with the authors we, of course, have had our failures.

This angiogram (slide) shows a major bleeding point in the cecum due apparently to a superficial ulceration. In this instance the bleeding was completely and permanently controlled by a localized infusion of Pitressin allowing this elderly poor risk patient to leave the hospital without surgery. In our experience the ability to control active bleeding by this method in the colon has been relatively more effective than the control of bleeding from deep peptic ulceration.

We agree with the authors that angiography in the diagnosis and treatment of acute gastrointestinal bleeding deserves wider and thorough study.

Dr. Leslie Wise (St. Louis): I would also like to congratulate Dr. Brant on his results. Our experience is similar to his, except for the diagnostic accuracy rate.

In our preliminary survey with diagnostic selective angiography of acute gastrointestinal bleeding, we have analyzed 68 cases. Thirty-four of these were positive, thus our yield was 50%. I think we are in a somewhat similar position as operating for acute appendicitis. If we wait until general peritonitis supravenes our diagnostic accuracy rate will be 100%. But if we operate earlier, as most of us do, our diagnostic accuracy will be considerably less.

Six of the studies which were negative for bleeding, however, demonstrated other abnormalities: two demonstrated the typical changes of cirrhosis of the liver; one showed esophageal varices; one demonstrated a large gastric tumor with metastases to the liver; another one showed the typical hyperemia and small vessel tortuosity of the colon, seen in ulcerative colitis; and finally one demonstrated narrowing of the gastroduodenal and pancreatico duodenal arteries, which was subsequently found to be due to a duodenal ulcer.

There were no serious complications directly attributable to the arteriography.

Arteriography was of value even in some cases of known duodenal ulcers and gastric ulcers. In some of these cases the bleeding was not coming from the main ulcer but from a bleeder high up on the lesser curve near the gastroesophageal junction.

With colonic lesions its value is enormous. Here again in some cases the bleeding was not coming from the obvious lesion (such as sigmoid diverticulitis) but from a bleeder in an apparently normal looking colon.

The average time for the performance of the complete arteriogram was less than one hour. We feel that selective arteriography is an extremely valuable tool in the diagnosis of acute gastrointestinal bleeding.

Dr. William S. Blakemore (Philadelphia): About 10 years ago we considered new approaches to the problems associated with gastrointestinal bleeding because of the high mortality for emergency operative procedures and the concomitant lack of diagnostic procedures. Acquainted with some of the information on organ catheterization from Scandinavian investigators, Dr. M. Nusbaum and Dr. S. Baum worked in the laboratory, and after early clinical experience now we can see several distinct areas that are being studied.

One area is that of diagnostic procedure. When the technical details are satisfactory and the bleeding of a patient cannot be demonstrated radiographically, we have confidence that the patient does not have arterial bleeding at the time of the study. Many details regarding other diagnostic uses have been discussed in earlier publications.

For the problems related to treatment of arterial bleeding, we use surgical pituitrin. Dr. Nusbaum worked in the laboratory with various vasoconstrictive substances, showing the site of vasconstriction within the vascular system of the gastrointestinal tract was different with surgical pituitrin and catecholamines. The portal venous bed showed less constriction with the former and arterial constriction with both and did not show tachyphylaxis with pituitrin.

There are several precautions that should be documented. A survey film after the institution of pituitrin or one of the vasoactive substances is required to determine the response in that patient. The dosage is then varied to obtain the desired degree of arterial constriction. In more than 50 patients, we have had only one who did not respond to infusion for variceal bleeding. That patient, with incresed dosage, did not show arterial constriction. In patients with arterial bleeding, the percentage of patients who stopped bleeding has not been as high. The main cause of failure has been the technical failures related to catheterizing the selected vessels. While it is not required to have this procedure done by a radiologist, experience by the man who performs it is required. He should give thought to the procedure beforehand and he should have certain equipment available.

Television video and video tape replay are very helpful as are magnification technics developed by Dr. Baum, who is now at the Massachusetts General Hospital. We think the pituitrin should be continued for 24 to 48 hours after bleeding has been controlled because of the incidence of recurrent bleeding which is a greater risk to the patient than properly monitored infusion for this extended period. The catheter should not be placed in or near the hepatic artery. The effects of long-term infusion on the liver are not known, but we suspect it might cause some damage. We do believe that you can give it safely in to the mesenteric arteries to the other organs, but it must be monitored by angiograms since excess vasoconstriction to the bowel may give you necrosis.

There remains to determine the role of vasodilatory drugs which we have found helpful in uncommonly occurring cases of nonocclusive mesenteric intestinal ischemia, seen with advanced heart failure and digitalis therapy. We have had success in this group of patients with intra-arterial drug therapy with prescaline or papaverine.

I would ask the essayists if they have encountered difficulties in catheterizing the superior mesenteric artery and the comparative difficulty in catheterizing the inferior mesenteric artery, which are probably two of the main reasons we fail in colon infusions.

DR. PHILIP SANDBLOM (Lund, Sweden): We have also had the great privilege of having radiologists interested and experienced in this field, and we agree that in all cases of acute gastrointestinal bleeders intra-arterial arteriography should be the first diagnostic procedure, especially during the bleeding period.

I rise to show a few examples of more unusual bleeding points, which might not have been discovered without arteriography. One of the main advantages of the method is that one is able to find bleeding sources which would escape attention otherwise, and which would be very hard or impossible to find during exploratory laparotomy.

[Slide] The first slide illustrates a case of severe gastrointestinal hemorrhage after trauma to the abdomen. The selective arteriography of the hepatic artery shows a cavity in the right lobe of the liver, thus demonstrating the site of a central liver rupture.

Before we had the arteriography, it was often very difficult to localize the site of lesions in the liver, and therefore hard to do any accurate treatment. In this case, which was bleeding at the time, Dr. Enge in Oslo, who did the examination, followed through, and 2 minutes later [slide] found that the contrast from the cavity was flowing down the biliary tract, thus demonstrating the communication between the artery and the biliary tract.

Another case of very severe gastrointestinal hemorrhage [slide] showed the reason to be an aneurysm in the splenic artery which had ruptured into the pancreatic duct. During bleeding, we see the contrast flowing down into the duct. The patient was successfully treated with resection of the pancreas and of the splenic artery.

I have not brought the slides of three cases of small arterial aneurysms in the small intestine, which were localized and could be found at laparotomy due to the arteriography, and could be cured by intestinal resection.

I agree that the treatment with the drugs described has less place in conditions with degenerative diseases in the arteries. I do not think it has proved very good in aneurysms, and neither for central liver ruptures as the arteries in the liver have very small ability to contract.

DR. MARSHALL J. ORLOFF (San Diego): Our own experience with several hundred patients who have been subjected to angiography for the diagnosis of upper gastrointestinal bleeding has led to great enthusiasm for the diagnostic use of this technic, and to continuing uncertainty about the therapeutic advantages of pharmacologic agents infused into the splanchnic circulation. Because of this uncertainty, I would raise certain questions about conclusions concerning the value of pharmacologic control of bleeding.

First, the question is: In how many patients would the bleeding have stopped without the use of pharmacologic agents? I believe this to be a legitimate question. We all know that patients with diverticular hemorrhage frequently stop spontaneously. That is certainly true of patients with gastritis; and I believe this issue must be settled before a definitive conclusion can be reached.

Second, I would ask the authors: How many attempts failed to get the catheter into the artery for infusion? We have been told about the successes, and they are impressive, but our own experience has indicated that there is a substantial number of patients who cannot be catheterized, and therefore can not be subjected to either diagnostic or therapeutic use of this approach.

In particular regard to the use of infusion of Pitressin to control bleeding from esophageal varices, our own experience, that of the group in Rochester and the reports of some seven or eight groups, this procedure has controlled temporarily the bleeding in 88% of the patients. From the various groups that have been interested in this approach, no one yet has commented on the effects of this approach on over-all mortality.

That is really the crux of the problem. The temporary control of bleeding from esophageal varices in cirrhotic patients by one means or another is not the problem; it is the influence of this approach on the survival of bleeding cirrhotic patients. I would ask if there is information about this point.

Finally, it has been our experience that the incidence of complications associated with this technic in the cirrhotic patient is higher, particularly the development of hematoma and bleeding at the site of catheter insertion, because of the coagulopathy which is well known to be associated with this disease.

I am amazed that the complication rate was so low; but of course the number of cirrhotics in this study is small. I would wonder, if this were used as a general approach to the control of bleeding esophageal varices in cirrhosis, if the complication rate just from the insertion of the catheter and prolonged infusion might not be considerably higher.

PRESIDENT MOORE: I would like to ask Dr. Krippaehne if he has added the infusion of some small, soft clot through the catheter in patients who would not respond to pharmacology?

DR. WILLIAM W. KRIPPAEHNE (Closing): Dr. Orloff's questions are appropriate but from this limited experience one cannot statistically separate and define exactly what the survival improvement would be if any. We must set up a prospective study to answer this which we plan to do.

In our series we had technical difficulty in catheterizing a vessel selectively in only one patient with a huge liver.

In the different categories of bleeding patients as we have separated them, we may have influenced survival in patients with varices bleeding in two to four of that group. In massive bleeding from chronic peptic ulcer we may have influenced survival in one. In the mixed non-peptic ulcer arterial bleeding many of this group have self-limited bleeding as a common pattern. However, one had bled 30 units of blood and was continuing to bleed after an emperic left colon resection. The diagnosis to locate the site of hemorrhage was important and he also stopped bleeding with infusion. In the group with gastritis and superficial ulceration we may have influenced survival in four of the 16 patients.

In answer to Dr. Moore's question, Dr. Rösch infused an autologous clot through the catheter into the bleeding artery of one patient which stopped the bleeding. In patients with platelet deficiencies and bleeding from gastritis, we have infused platelets directly through the catheter into the arterial supply from which the bleeding small vessels received their major blood supply. This has resulted in cessation of bleeding. In thrombocytopenia and thrombopathic states the selective infusion of platelets probably deserves further trial and comparison with intravenous platelet infusions. In the platelet defect associated with uremia, dialysis would appear to offer advantages in correcting the fundamental disorder.