

Transcatheter Arterial Embolization with N-Butyl Cyanoacrylate for Acute Life-threatening Gastroduodenal Bleeding Uncontrolled by Endoscopic Hemostasis

Hiroyuki Morishita, PhD, MD, Takuji Yamagami, PhD, MD, Tomohiro Matsumoto, PhD, MD, Shunsuke Asai, MD, Koji Masui, MD, Hideki Sato, PhD, MD, Atsushi Majima, MD, and Osamu Sato, PhD, MD

ABSTRACT

Purpose: To investigate the feasibility, efficacy, and safety of transcatheter arterial embolization with N-butyl cyanoacrylate (NBCA) for gastroduodenal nonvariceal bleeding uncontrolled by endoscopic hemostasis.

Materials and Methods: Between January 2006 and December 2011, a total of 317 patients underwent emergent endoscopic therapy for nonvariceal gastroduodenal bleeding, but hemostasis was not achieved in 20 cases. Emergent surgery was performed immediately following endoscopy in two patients. Arteriography was performed in the remaining 18 patients, and embolization with NBCA was performed in 15 patients (mean age, 71.3 y) in whom the bleeding site was detected on arteriography. For embolization, NBCA was mixed with iodized oil at a ratio of 1:1.5–1:4, and no other embolic material was used in the procedure. Technical and clinical success rates, recurrent bleeding, procedural time, complications, and clinical outcomes were determined for each procedure.

Results: Embolization with NBCA was technically and clinically successful in all procedures, without major complications. No patient receiving embolization with NBCA experienced recurrent bleeding or required further treatment after the one-session procedure. All patients were discharged after clinical improvement. The time between puncture of the femoral artery and completion of embolization ranged from 25 to 240 minutes (mean, 66 min), and the time between the microcatheter reaching the ultimate catheter location selected for embolization and hemostasis ranged from 142 to 550 seconds (mean, 322 s).

Conclusions: In this limited series, embolization with NBCA was found to be a safe, feasible, and effective treatment for gastroduodenal arterial bleeding when endoscopic hemostasis had failed.

ABBREVIATIONS

GDA = gastroduodenal artery, NBCA = N-butyl cyanoacrylate, PVA = polyvinyl alcohol

Vascular embolization is widely considered as the first-line alternative treatment for severe gastroduodenal bleeding

refractory to endoscopic treatment (1,2). According to many reports, technical and clinical success rates of endovascular treatment are high, ranging from 69% to 100% and from 63% to 97% (2), respectively. The embolic agents described in the literature are various, and the choice of the best embolic agent remains a matter of debate (2). Of course, coils are considered the first-choice embolic material, as supported by a great deal of experience with embolization with coils. However, coil embolization is not always successful, depending on anatomy, the size of arterial lesions, technical ability, and coagulopathy related to the administration of anticoagulant or antiplatelet drugs and disseminated intravascular coagulation (3). In addition, failure of coil embolization results in a life-threatening situation, especially when the patient is in critical condition (3).

From the Departments of Diagnostic Radiology, (H.M., T.M., S.A., O.S.) and Gastroenterology (H.S., A.M.), Japan Red Cross Kyoto Daiichi Hospital; and Department of Radiology (T.Y., K.M.), Graduate School of Medical Science, Kyoto Prefectural University of Medicine, Kyoto, Japan. Received September 25, 2012; final revision received December 17, 2012; accepted December 18, 2012. Address correspondence to H.M., Department of Diagnostic Radiology, Japanese Red Cross Kyoto Daiichi Hospital, 15-749 Honmachi, Higashiyama, Kyoto 605-0981, Japan; E-mail: hmorif@koto.kpu-m.ac.jp

None of the authors have identified a conflict of interest.

© SIR, 2013

J Vasc Interv Radiol 2013; 24:432–438

<http://dx.doi.org/10.1016/j.jvir.2012.12.017>

Loffroy et al (4) reported that the use of coils alone was significantly associated with early recurrent bleeding. To achieve hemostasis in a critical situation, it is favorable to select the embolic material that can embolize the bleeding vessel completely and permanently in a short time. N-butyl cyanoacrylate (NBCA; Histoacryl; B. Braun, Tuttlingen, Germany) is compatible with these requirements: (i) NBCA can embolize bleeding vessels not occluded with coils (3); (ii) NBCA is a liquid and permanent embolic material (3); and (iii) the polymerization time for NBCA/iodized oil mixtures at ratios of 1:1–1:4 is 1–4 seconds (5). Indeed, NBCA, a rapidly hardening liquid adhesive agent, has been used as an effective polymerizing liquid embolic agent for gastroduodenal artery (GDA) hemorrhage (6–8), but its applications have been limited because of technical difficulties and the risk of organ ischemia (2).

Our purpose in the present study was to investigate if transcatheter arterial embolization with NBCA alone is a feasible, effective, and safe method for the treatment of nonvariceal gastroduodenal bleeding uncontrolled by endoscopic hemostasis.

MATERIALS AND METHODS

This was a retrospective study of patients treated for nonvariceal gastroduodenal bleeding treated by transcatheter arterial embolization with NBCA. All procedures were performed according to the ethical standards of the World Medical Association Declaration of Helsinki. Our institutional review board does not require approval for this type of retrospective study. Written informed consent was obtained from all patients.

Patients

Between January 2006 and December 2011, a total of 317 emergent endoscopic therapies were performed for patients with life-threatening nonvariceal gastroduodenal bleeding (209 men and 108 women; mean age, 67.6 y) at our institution. Emergent endoscopic therapy was attempted in all cases, but endoscopic hemostasis was not achieved in a total of 20 cases. Emergent surgery was performed immediately following endoscopy in two patients who had experienced cardiopulmonary arrest during endoscopy. Soon after endoscopic hemostasis failed, arteriography was performed for the remaining 18 cases, and embolization with NBCA was attempted in 15 cases in which the bleeding site was detected on arteriography. These included 12 men and three women, with a mean age of 71.3 years. The characteristics of each case are shown in **Table 1**. Before endoscopy, all patients were in unstable hemodynamic condition. The mean hemoglobin level before the procedure was 8.0 g/dL (range, 5.3–10.9 g/dL), and 13 patients received blood transfusions (mean, 6.3 U packed red blood cells; range, 2–12 U). In the three cases in which the bleeding site was not identified on arteriography, empiric embolization with coils was attempted in

one case and no interventional therapy was attempted in the other two. Incidentally, the patient treated with coil embolization experienced recurrent bleeding 170 days after the procedure, and hemostasis was finally achieved by embolization with NBCA (patient 12; **Table 1**).

The underlying diseases were gastric ulcer (n = 7), duodenal ulcer (n = 5), gastric cancer (n = 1), duodenal tumor (n = 1), and pseudoaneurysm of the pancreaticoduodenal artery (n = 1). The embolized arteries were the left gastric artery (n = 6; gastric branch, n = 5; main branch, n = 1), duodenal branch of anterior superior pancreaticoduodenal artery (n = 2), duodenal branch of inferior pancreaticoduodenal artery (n = 2), duodenal branch of posterior superior pancreaticoduodenal artery (n = 1), duodenal branch of posterior inferior pancreaticoduodenal artery (n = 1), gastric branch of right gastric artery (n = 1), main branch of splenic artery (n = 1), and main branch of GDA (n = 1).

Ten cases had additional coagulopathic factors that further complicated the achievement of hemostasis: administration of antiplatelet drug (n = 5; aspirin, n = 4; cilostazol, n = 1), administration of anticoagulant and antiplatelet drugs (n = 2, including one patient undergoing dialysis; warfarin potassium, n = 2; sarpogrelate HCl, n = 1; and ticlopidine HCl, n = 1), disseminated intravascular coagulation (n = 2), and dialysis alone (n = 1).

Procedure

In our daily clinical work as interventional radiologists in an emergency unit, NBCA has been used for many years to embolize bleeding that is uncontrollable with coil embolization. There might be advantages to the use of NBCA because it can achieve embolization more quickly than coils (9), and NBCA can be used in cases complicated by coagulopathy because NBCA polymerization is not affected by the coagulation process (10). Indeed, all the patients described in the present study were in a critical situation, and 10 of 15 showed characteristics of coagulopathy. The use of NBCA was approved by a multidisciplinary conference involving emergency physicians, surgeons, endoscopists, and interventional radiologists, and patients or their families agreed to treatment with NBCA embolization.

The procedure was performed under local anesthesia via a right femoral approach. First, a 5-F shepherd hook-shaped catheter (Terumo Clinical Supply, Gifu, Japan) was inserted, and diagnostic celiac and superior mesenteric arteriography was performed in all 18 cases. In five cases, extravasation of contrast medium was identified on celiac arteriography (n = 3) or superior mesenteric angiography (n = 2). Then, arteriography via the splanchnic arteries was performed after the coaxial advancement of a 2.2-F microcatheter (Progreat β; Terumo Clinical Supply). In 15 cases, including the five cases mentioned earlier, the extravasation of contrast medium or a pseudoaneurysm was identified near the clip, which was used for endoscopic

Download English Version:

<https://daneshyari.com/en/article/4238961>

Download Persian Version:

<https://daneshyari.com/article/4238961>

[Daneshyari.com](https://daneshyari.com)