Are MR Compatible hemoclips safe after control of hemostasis?

An 82-year-old man with a medical history of hypertension and cerebrovascular disease was referred to our clinic with hematemesis. Laboratory findings were: hemoglobin 8.5 g/dL (normal range 14–18 g/dL), white blood cells 16.1 × 10^9/L (normal range 4–10 × 10^9/L), and platelets 74 × 10^9/L (normal range 150–400 × 10^9/L). He was given a transfusion of two units of packed red blood cells. He underwent emergency endoscopy, which revealed bright red blood in the esophagus and stomach. Below the upper esophageal sphincter, a long, deep, linear laceration with an adhering blood clot was seen in the proximal esophagus (Fig. 1a). A hemoclip (Instinct; Cook Medical Inc., Bloomington, Indiana) was applied at both edges of the laceration (Fig. 1b). He was placed on a proton pump inhibitor infusion and kept nil per os. His hemoglobin level subsequently stabilized at 11.6 g/dL without further transfusion. Six days later, he noticed decreased strength in his right hand. Brain magnetic resonance imaging (MRI) showed extensive cytotoxic edema within the parietal lobe indicating acute infarction of the left middle cerebral artery territory (Fig. 1c). During the return to his hospital room, the patient started vomiting blood. Cardiopulmonary arrest occurred as a result of the sudden massive hematemesis, and the patient died. Endoscopic clipping devices have been used to achieve hemostasis of focal gastrointestinal bleeding [1]. Hemoclips will spontaneously slough off in approximately 3–4 weeks, but can also remain at the site of application for up to 1 year [2]. The Instinct hemoclip is a stainless steel clip that can be rotated, closed, reopened, and repositioned. It is “MR Conditional,” a safety term which indicates that the device has been demonstrated to pose no known hazards in a specified MRI environment with specified conditions of use [3]. However, we tested a closed Instinct hemoclip in the MRI scanner and it flew instantly to the magnet (Fig. 1d).

In conclusion, it would seem from the present case that magnetically induced displacement force, torque, and vibration may cause clip migration, resulting in severe rebleeding with lethal outcome. Therefore, a high level of attention is warranted for entry to the MRI suite, even for patients who have received MR Conditional hemoclips.

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References

Bibliography
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Corresponding author
Mevlut Kurt, MD
Department of Gastroenterology
Faculty of Medicine
Abant Izzet Baysal University
PK: 14280, Golkoy
Bolu
Turkey
Fax: +90-374-2534615
dr.mevikutkurt@gmail.com