Safety of the long-term application of QuikClot Combat Gauze, ChitoGauze PRO and Celox Gauze in a femoral artery injury model in swine – a preliminary study

I. Otrocka-Domagała1, P. Jastrzębski2, Z. Adamiak3, K. Paździor-Czapula1, M. Gesek1, M. Mikiewicz1, T. Rotkiewicz1

1 Department of Pathological Anatomy, Faculty of Veterinary Medicine, University of Warmia and Mazury in Olsztyn, Oczapowskiego 13, 10-719 Olsztyn, Poland
2 Security Fundamentals Unit, Police Academy, Piłsudskiego 111, 12-100 Szczytno, Poland
3 Department of Surgery and Radiology, Faculty of Veterinary Medicine, University of Warmia and Mazury, Oczapowskiego 14, 10-719 Olsztyn, Poland

Abstract

The purpose of this study was to examine the safety of the long-term application of QuikClot Combat Gauze, ChitoGauze PRO and Celox Gauze using a swine model. The study was conducted on nine pigs weighing approximately 30 kg, which were randomly divided into three groups. Under deep anesthesia, the pigs underwent complete transverse cutting of the femoral artery in the groin region. Hemostatic dressings were left in the wound for 24 hours. The animals were euthanized 24 hours after dressing application. In each group, macroscopic and microscopic severe changes and shock symptoms were observed in the lungs, liver, kidneys and heart. Fibrino-gaseous embolic material was found in the pulmonary artery of each group and in the lung vessels of the animals from the ChitoGauze PRO and Celox Gauze groups. In conclusion, the long-term application of the evaluated hemostatic dressings has the risk of coagulopathy and reaching the progressive stage of shock. The residues from the hemostatic dressings can ingress into the systemic circulation, thereby increasing the risk of embolus formation. Because of these harmful effects, the evaluated hemostatic dressings are not appropriate for long-term use. Future studies are needed on the consequences of the long-term application of these hemostatic agents.

Key words: hemostatic dressings, kaolin, chitosan, shock, thromboemboli, swine model

Correspondence to: I. Otrocka-Domagała, e-mail: i.otrocka-domagala@uwm.edu.pl