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Geli Putty®: a new alternative on sternal hemostasis in cardiac surgery

Geli Putty®: uma nova alternativa na hemostasia esternal em cirurgia cardíaca

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We present a gelatin that fills the medullary of sternum providing effective hemostasis plus protection for each sternal end.

***Descriptors:* Hemostatics. Sternum. Cardiac surgical procedures. Postoperative complications. Surgical wound infection.**

Apresentamos uma solução à base de gelatina, que preenche a medula esternal, oferecendo eficiente hemostasia, além de proteção para as extremidades do esterno.

***Descritores:* Hemostáticos. Esterno. Procedimentos cirúrgicos cardíacos. Complicações pós-operatórias. Infecção da ferida operatória.**

INTRODUCTION

Cardiovascular surgery has expanded its field of action with the approach to ever more severe patients, the elderly and with multiple comorbidities. Also, surgeries in a matter of urgency are common, performed in the presence and use of antiplatelet agents or anticoagulants, resulting in increased perioperative bleeding and consequent negative interference in the results [1]. The use of chemical agents in the operative field has been an adjunct to hemostasis in surgical aid. These substances induce coagulation by local activity on the site of bleeding with immediate effect, manageable, and is therefore a useful alternative [2,3].

This report describes a hemostatic absorbable gelatin-based Geli Putty® (Gelita Medical B.V.), demonstrating clinical efficacy and safety in sternal hemostasis in cardiac surgery.

CASE REPORT

This case report is in accordance with the provisions of the Research Ethics Committee of the Hospital Beneficência Portuguesa of São Paulo.

74-year-old patient, female, admitted to hospital for coronary artery bypass grafting. Hypertensive, diabetic, dyslipidemic, overweight and a smoker for thirty years, having stopped for five. Pulmonary auscultation with diffuse decrease of vesicular murmur and rare breath sounds and wheezing. Biochemical tests, electrocardiogram, echocardiogram and chest radiograph were normal. Coronary angiography showed 80% lesion in left anterior descending artery, after emergency of the first septum, a 90% lesion in the right coronary artery, in the middle third, and injury to 80% in the first marginal of the circumflex artery, in the proximal third. Left ventriculography presented within normal limits.

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This study was carried out at Hospital Beneficência Portuguesa of São Paulo, São Paulo, SP, Brazil.

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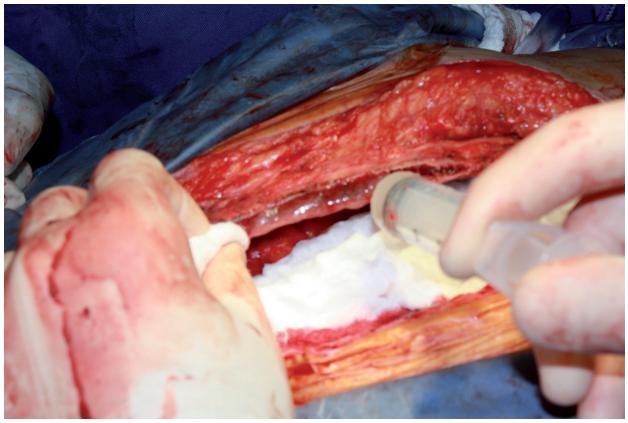


Fig. 1 – Geli Putty® being applied to the sternum

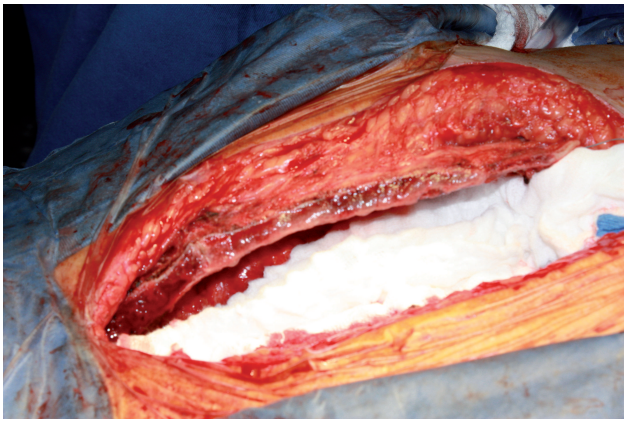


Fig. 2 – Sternum after application of Geli Putty®

After general anesthesia, we proceeded with midline incision, followed by sternotomy and periosteal hemostasis with electrocautery. As a result, the application of gelatin (Geli Putty® Gelita Medical B.V.) was performed in the sternal marrow. The contents of a container was diluted with 20 mL of saline solution and applied directly in the marrow of each of the halves of the sternum, so as to cover them completely (Figures 1 and 2).

This procedure took approximately two minutes, long enough to the action of gelatin. Following, the sternal retractor was placed and the surgical procedure performed in the usual way. We performed: a graft of left internal thoracic artery to anterior descending artery and two right saphenous vein grafts to the first marginal circumflex arteries (retro) and right coronary artery. After the main procedure, it was observed after removal of the fields and the retractor, a thin layer of blood clot in each of the sternal halves. Following, a sternotomy was performed with steel wire and closed in layers. The time taken to put the gelatin was offset in the final phase of hemostasis prior to sternotomy.

DISCUSSION

An efficient hemostasis of the bone marrow after sternotomy improves the conditions in the surgical field, reduces bleeding and preserves blood backquote. The bone wax is commonly used because it is effective and of low cost. It can be applied with the finger, even in mini approaches and has immediate action, since seals the gaps of trabecular spongiosa of the sternum. However, bone wax is a foreign body that degrades slowly and is not completely eliminated by the end of the procedure, because it penetrates deep into the sternal marrow [4].

In severely osteoporotic sternum, it is not unusual large pieces of wax remain in the gaps of the spongy bone. There is a general consensus that bone wax may affect the consolidation of the sternum [5], which is particularly important in patients at high risk for sternal complications, such as elderly, obese, diabetic, pulmonary disease, chronic renal failure and patients on corticosteroid therapy [6 -13]. The sternal dehiscence can significantly prolong the hospital stay and become a lethal complication. This stimulated the development of products to assist in the management of bleeding associated with median sternotomy [14].

In this context, the gelatin has excelled due to its wide availability, easy handling, no need of additional equipment for administration, in addition to prove to be effective and safe. The gelatin applied to the sternal bone behaves as a buffer, increasing its weight by 50 times and creating a waterproof film in the bone marrow. This may also favorably affects the sternum consolidation, especially when the edges of the sternum, for whatever reason, are particularly vulnerable. The material has the advantage of low cost, full reversibility, ease of application and absence of potential complications associated with the use of bone wax.

Thus, we conclude that Geli Putty® is a new effective and safe alternative in sternal hemostasis in cardiac surgery.

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