Cement Burn of the Skin During Total Hip Arthroplasty: A Case Series

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Abstract
Bone cement which can reach temperatures of >100°C, is commonly used to fix the femoral stem in total hip arthroplasty (THA). However, reports on skin burns due to bone cement are rare. The primary purpose of this article is to report these rare cases to prevent these complications. Two cases were simultaneous bilateral THA (case A and B) and two cases were unilateral THA (case C and D) are discussed in this case report. In these cases, the maximum thickness of excessive bone cement was >10 mm.

Keywords: Cement burn; Bone cement; Total hip arthroplasty; Case series

Introduction
Hip replacement is a surgical procedure in which the hip joint is replaced by a prosthetic implant, that is, a hip prosthesis. Hip replacement surgery can be performed as a total replacement or a hemi replacement. Where the damaged bone and cartilage is removed and replaced with prosthetic components.

Case Series
From January 1 to September 30, 2018, a total of 841 primary THA procedures were performed in our hospital via a direct anterior approach. Of these, bone cement (COBALT® G Bone Cement System; Zimmer Biomet, Warsaw, IN, USA) was used for stem fixation in 312 cases. In these cases, uncemented cup and polyethylene acetabular liner were used. Two cases were simultaneous bilateral THA (case A and B) and two cases were unilateral THA (case C and D). Case A was a 63-year-old man, Case B was a 61-year-old woman, Case C was a 67-year-old woman, and Case D was a 69-year-old woman. All patients were classified as I in accordance to the American Society of Anaesthesiologists. The average operation time was 37 and 88 min in unilateral and simultaneous bilateral THA, respectively. The average blood loss was 300 and 768 ml in unilateral and simultaneous bilateral THA, respectively. No patient had any complaint of dermatological problem as a past medical history. After cementing the femoral component, excess cement that stuck to the bandage that covered the

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Cement surface is higher for thicker mantles, from approximately 41°C for a 1-mm-thick cement layer to 56°C for a 5-mm-thick layer and up to 60°C for a 7-mm-thick layer [5]. Cement mantles are typically only 2-3 mm thick [1]. In addition, Reissis et al. reported that cells can survive temperatures of up to 48°C for 150s, but most perish upon exposure to >58°C for the same incubation period [7]. Therefore, the potential for thermal damage is an uncommon complication during standard THA procedure [1-8]. However, larger pieces of bone cement could cause severe contact burns even to the cement that is in contact with the surface of the bandage. In these cases, the maximum thickness of excessive bone cement was >10 mm. Therefore, skin burns remain a possible complication unless excessive bone cement is promptly discarded.

**Conclusion**

The excessive bone cement, attached to the areas of the compressed skin (heel, lateral malleolus of ankle, and calf), could be one of the reasons for delayed discovery. Similar colours of the bandage and bone cement could also delay the discovery of such skin burns. Excessive bone cement should be promptly discarded to prevent burn complications on the skin surface.

**Conflicts of Interest**

The authors declare that there are no conflicts of interest regarding the publication of this paper.

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