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Which Classification of Proximal Humerus Fractures Leads to Postoperative Avascular Necrosis of the Humeral Head?

Takeshi Kawakami, MD, PhD, JAPAN

Teruhisa Mihata, MD, PhD, JAPAN Akihiko Hasegawa, MD, PhD, JAPAN

Towaki Hospital Takatsuki, Oaka, JAPAN

Summary:

The purpose of this study was to determine which classification of proximal humerus fractures leads to postoperative avascular necrosis of the humeral head. The 3-part and head-split fracture in Neer classification, C2-2, C3-2, C3-3 in AO classification, and Type1B, Type3, Type4 in Yamane classification had high rate of postoperative avascular necrosis of the humeral head.

Abstract:

Background: The purpose of this study was to determine which classification of proximal humerus fractures leads to postoperative avascular necrosis of the humeral head.

Methods: Between January 2008 and June 2015, 76 patients with proximal humeral fractures underwent open reduction and internal fixation. There were 24 males, 52 females. Mean age was 66.9 years old (21-93 years old) and average follow-up was 17.9 months (5-42 months). Fracture types in all patients were evaluated using Neer classification, AO classification, and Yamane classification. The number of postoperative avascular necrosis was recorded in each fracture type.

Results: Seven patients (9.2%) had avascular necrosis of the humeral head after surgery. In Neer classification, 3 of 3-part fracture (11%), 1 of 4-part fracture (17%), 3 of 3-part dislocated fracture (60%), and head-split fracture (100%) had postoperative avascular necrosis. In AO classification, 1 of B2-2 (17%), 1 of C1-1 (33%), 2 of C2-2 (67%), 2 of C3-2 (67%) and 1 of C3-3 (100%) suffered postoperative avascular necrosis. In Yamane classification, 4 of Type1B (80%), 2 of Type3 (100%) and 1 of Type4 (100%) resulted in AN. Discussion:

The 3-part and head-split fracture in Neer classification, C2-2, C3-2, C3-3 in AO classification, and Type1B, Type3, Type4 in Yamane classification had high rate of postoperative avascular necrosis of the humeral head. Preoperative evaluation of fracture types using some classifications is useful to predict the risk of postoperative avascular necrosis.