Skin puckering as a sign of humeral neck fracture

SJ ALSHRYDA¹, S ODAK², AD PATEL³

¹Department of Trauma and Orthopaedics, Royal Hospital of Sunderland, Sunderland, UK

²Department of Trauma and Orthopaedics, Fairfield General Hospital, Bury, UK

³Institute of Orthopaedics, Norfolk and Norwich University Hospital NHS Trust, Norwich, UK

ABSTRACT

To the best of our knowledge, this is the first clinical report of skin puckering associated with fractured neck of humerus. Its significance may vary in different locations and its presence should be added to other physical and radiological signs to aid decision making.

KEYWORDS

Skin puckering – Humeral neck fracture

CORRESPONDENCE TO

SJ Alshryda, Department of Trauma and Orthopaedics, Royal Hospital of Sunderland, Kayll Road, Sunderland SR4 7TP, UK
T: +44 (0)191 565 6256; E: sattar26@doctors.org.uk

Proximal humeral fractures represent 4–5% of all fractures seen in accident and emergency departments in the UK.¹ About 15% of these humeral fractures need surgery and form a significant part of the work-load of an orthopaedic trauma service. Nevertheless, clear guidelines for surgical intervention are lacking.²

We present a new physical sign (skin puckering), which can be helpful in decision-making. Skin puckering occurs when the distal fragment buttonholes through deltoid muscle and comes to lie in the dermis. This means that there is a significant force caused by a marked displacement at the fracture site. Also, there is almost always soft tissue interposition and this requires manipulation and, possibly, open-reduction.

Case report

A 53-year-old woman shelf-filler fell from a ladder onto her left shoulder. She felt a crunch in her shoulder, which became swollen, and painful and she was unable to move it. Examination revealed a swollen and bruised shoulder with marked skin puckering (Fig. 1). She was very tender to move and there was no neurovascular defect. X-ray showed displaced fracture of surgical humeral neck (Fig. 2).

An attempt was made to reduce the humeral neck fracture by close methods, but this proved unsuccessful. Through a deltopectoral approach, the fracture site was explored. The proximal end of the distal fragment had buttonholed through the deltoid muscle and was lying in the dermis (Fig. 3). The fracture could be reduced once the interposed soft tissue was cleared from the fracture. An Ace plate was used to fix the fracture.

Figure 1 Patient showing a swollen and bruised shoulder with marked skin puckering.

Figure 2 X-ray showing displaced fracture of surgical humeral neck.

Figure 3 Photograph showing that the proximal end of the distal fragment had buttonholed through the deltoid muscle and was lying in the dermis.

Postoperative film showed good reduction and subsequent follow-up indicated good healing with an excellent function and range of movement.

Discussion

Neer⁵ was among the first to recognise the deficiency of traditional methods in classification as well as standardisation in treatment policy. He proposed two-, three- and four-part fractures and fracture dislocation based on observations first made by Codman in 1934. The degree of separation of fracture fragments has prognostic implications and thus is taken into account as an adjustment of treatment regimen.⁴

Based on Neer's work,⁵ hemi-arthroplasty has become widely accepted for the management of four-part fracture and fracture dislocation of the proximal humerus. However, the optimal treatment of the two- and three-part lesions has remained a matter of controversy. Non-surgical treatment often results in severe malunion and poor functional results. Traditional open reduction may lead to more accurate anatomical reduction; however, extensive tissue dissection

doubles the risk of avascular necrosis.⁵ More recently, minimally invasive surgery is gaining popularity as it entails minimal soft tissue dissection.

Skin puckering is a valuable sign of extensive soft tissue injury, periosteal disruption and gross motion. Our experience with three patients who presented with fracture neck of humerus and skin puckering showed that the presence of this sign is almost always associated with marked displacement and soft tissue interposition. They all needed open reduction and internal fixation. However, we still recommend manipulation under general anaesthetic; if this fails, surgical intervention is recommended.

Skin puckering is, however, a sign that is not unique to the shoulder. It has been reported in tibia fractures, supracondylar humeral fractures and clavicle fractures.

Conclusions

To the best of our knowledge, this is the first clinical report of skin puckering associated with fractured neck of humerus. Its significance may vary in different locations and its presence should be added to other physical and radiological signs to aid decision making.

References

1. Horak J, Nilsson BE. Epidemiology of fracture of upper end of humerus. *Clin Orthop* 1975; **112**: 250–3.
2. Wachtl SW, Marti CB, Hoogewoud HM, Jakob RP, Gautier E. Treatment of proximal humerus fracture using intermedullary flexible nails. *Arch Orthop Trauma Surg* 2000; **120**: 171–5.
3. Neer II CS. Displaced proximal humeral fractures. Part II. Treatment of three-part and four-part displacement. *J Bone Joint Surg Am* 1970; **52**: 1090–103.
4. Chen CY, Chao EK, Tu YK, Ueng SW, Shih CH. Closed management and percutaneous fixation of unstable proximal humerus fractures. *J Trauma* 1998; **45**: 1039–45.
5. Hagg O, Lundberg BJ. Aspects of prognostic factors in comminuted and dislocated proximal humerus fractures. In: *Surgery of the Shoulder*. Philadelphia, PA: Decker, 1984.