Basicervical fracture is a controversial type of hip fracture, which can be regarded as either extracapsular or intracapsular. It is seldom mentioned in the authorized orthopaedic textbooks, and it lacks an exact definition in the most commonly used classifications. The aim of this study was to evaluate the rate of basicervical hip fractures and the methods of treating them in a prospective series of 1624 consecutive hip fractures. Standardized forms were used to collect information, including the classification of fracture types. Initially, 108 fractures were classified as basicervical, but a careful second-look check revealed that 51 were transcervical fractures, while 27 fractures had a trochanteric extension. Thus, 30 of the fractures fulfilled the criteria of basicervical fracture (rate 1.8%). The 14 fractures treated as extracapsular fractures (dynamic hip screw, DHS, or gamma nail) showed a better outcome than the 16 treated as intracapsular fractures (hemiarthroplasty or screw osteosynthesis). We conclude that basicervical fracture of the hip is a very uncommon entity, but it is worth considering and should be treated as a trochanteric fracture.

Keywords Basicervical · Classification · Extracapsular fracture · Fracture · Hip fracture · Intracapsular fracture

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Basicervical fracture – a rare type of hip fracture

Received: 21 December 2000 / Published online: 7 September 2001
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Abstract Basicervical fracture is a controversial type of hip fracture, which can be regarded as either extracapsular or intracapsular. It is seldom mentioned in the authorized orthopaedic textbooks, and it lacks an exact definition in the most commonly used classifications. The aim of this study was to evaluate the rate of basicervical hip fractures and the methods of treating them in a prospective series of 1624 consecutive hip fractures. Standardized forms were used to collect information, including the classification of fracture types. Initially, 108 fractures were classified as basicervical, but a careful second-look check revealed that 51 were transcervical fractures, while 27 fractures had a trochanteric extension. Thus, 30 of the fractures fulfilled the criteria of basicervical fracture (rate 1.8%). The 14 fractures treated as extracapsular fractures (dynamic hip screw, DHS, or gamma nail) showed a better outcome than the 16 treated as intracapsular fractures (hemiarthroplasty or screw osteosynthesis). We conclude that basicervical fracture of the hip is a very uncommon entity, but it is worth considering and should be treated as a trochanteric fracture.

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Introduction

Basicervical fracture is a controversial type of hip fracture, and it has been regarded as an extracapsular or intracapsular fracture by different authors [1, 3, 8, 13, 14, 15, 17]. Parker et al. defined it as a fracture in which the fracture line runs along the line of the anterior attachment of the capsule [13], while Blair et al. specified it as a proximal femoral fracture through the base of the femoral neck at its junction with the intertrochanteric region [1]. Due to this anatomical location, basicervical fracture represents an intermediate form between femoral neck and intertrochanteric fractures [1]. The authorized textbooks on orthopaedics and traumatology merely mention basicervical fractures as a category of extracapsular fractures, and the most frequently used classifications of hip fractures do not consider them as a separate entity [3, 4, 12, 15, 17]. The true quality of basicervical fractures may, nevertheless, be obscured by the fact that they are almost invariably included in the broader group of fractures of the trochanteric region [6, 8, 10]. They are included in some surveys on the treatment of hip fractures [1, 2, 5, 6, 8, 9, 10, 11, 16], but there are only two studies that focus on basicervical fractures as a separate entity [1, 8].

The aim of this study was to evaluate the rate of basocervical hip fractures and the methods used in their treatment in a prospectively collected, extensive series of consecutive hip fractures.

Patients and methods

The material consisted of 1624 hip fractures treated in our hospital during the 8-year period from January 1989 to the end of December 1996. Standardized forms were used to collect pre-fracture information [7]. Re-operations and the reasons for them were recorded up to the end of 1998 on separate standardized forms, the mean follow-up time being 5.0 years (range 2–10 years). The fractures were classified by the surgeons into six different types, as described earlier by Jalovaara et al. [7]: (1) undisplaced cervical (Garden I&II), (2) displaced cervical (Garden III&IV), (3) basicervical, (4) trochanteric, two-fragment fractures, (5) trochanteric, multi-fragment fractures, and (6) subtrochanteric fractures. The basicervical fractures were here defined to be proximal femoral fractures through the base of the femoral neck at its junction with the intertrochanteric region, as proposed by Blair et al. [1] (Fig.1). The classification was done with the help of routine radiographs. All the fractures initially classified as basicervical were re-evaluated independently by us. Cases for which the observers’ classifications disagreed were re-evaluated jointly. The fractures initially classified as cervical and trochanteric were also re-evaluated, but no cases that could be evaluated as basicervical fractures were found.

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DOI 10.1007/s004020100306
Both anteroposterior and lateral X-ray projections were analyzed. Special attention was given to the examination of the possible extension of the fracture line into the cervical or trochanteric regions. If any extensions were found, the case in question was excluded from the category of basicervical fractures.

Results

Classification and exclusions

Altogether 108 of the 1624 fractures were initially classified by the surgeons as basicervical fractures. In a careful second-look check, 51 of them were re-classified as transcervical fractures with a small piece of lateral collum left (Fig. 2), while 27 were excluded because of a trochanteric extension (the two examiners agreed on the classification in all but 5 cases, which were all excluded after a joint re-evaluation) (Fig. 3). Thus, 30 fractures fulfilled all the criteria of basicervical fracture (11 men, mean age 75 years / 19 women, mean age 78 years). The definitive rate of basicervical fractures was thus 1.8%.

Treatment methods

Sixteen cases were treated as intracapsular fractures, 7 with fixation with three cancellous screws (mean age 71 years, range 53–84 years, 6 men/1 woman) and 9 with cementless Austin-Moore hemiarthroplasty (mean age 80 years, range 63–90 years, 3 men/6 women). Fourteen were treated as extracapsular fractures, 10 with a dynamic hip screw (DHS), (mean age 77 years, range 51–89 years, 1 man/9 women) and 4 with a gamma nail (mean age 78 years, range 66–87 years, 1 man/3 women).

Complications and re-operations

In three of the patients treated with cancellous screw osteosynthesis, the screw penetrated through the femoral head. One of them was managed with total hip replacement (THR) and two with removal of the screws, leading to pseudoarthrosis in one case and to Girdlestone hip in one case. One of the patients treated with Austin-Moore hemiarthroplasty underwent a total hip replacement 7 months after the primary operation because of continuous hip pain. There was only one re-operation in the DHS group: This patient sustained a re-fracture due to a fall and was treated with THR 4 months after the primary operation. The gamma-nail group included two late nail removals after the healing of the fracture, which were not regarded as complications.

Discussion

The definition of basicervical fracture is inaccurate, and a misdiagnosis of basicervical fractures is hence possible. Classification based on radiographs may often be difficult due to poor quality and possibly inadequate projections. In anteroposterior radiographs, a basicervical fracture is often obscured by the trochanteric area, which makes the fracture line poorly visible or invisible. Two-thirds of the incorrectly classified cases in this study belonged to this category.

A proper lateral projection shows the level of the fracture line and the possible remnant of the collum at the cervico-trochanteric junction and is thus essential for a reliable classification. Extensions of fractures into the trochanteric area are easier to observe in both anteroposterior and lateral projections, and the main reason for an inadequate fracture classification thus seemed to be the surgeon’s ignorance of the exact definition of a basicervical fracture.

There are only a few previous studies that have concentrated on basicervical fractures as a separate entity, and the treatment of basicervical hip fractures remains controversial [1, 8, 16]. A variety of operative techniques has been used.

Surgical treatment of basicervical fractures is regarded as basically not problematic [4, 8, 14, 17], but previous studies have demonstrated a high incidence of complications leading to re-operations [6, 8, 10], as was also the case in this study. Hence, this special entity of hip fracture is worth considering.

In our study, treating basicervical fractures as trochanteric fractures proved superior to treating them like cervical fractures, resulting in lower re-operation rates, which is in accordance with previous reports [1, 5, 8, 11]. Similar findings were reported by Kuokkanen in 1991, demonstrating that the use of multiple pins or screws may be hazardous in the treatment of basicervical fractures [8].

Our result is also in agreement with the biomechanical study by Blair et al., who found the sliding hip screw to be biomechanically superior to the multiple cancellous screws.