ORIGINAL ARTICLE

Trends in management of neck of femur fracture

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Abstract

Objective: To identify trends related to surgical procedure for the management of neck of femur fracture to see how the choice is changing over time in relation to different age groups.

Methods: The retrospective audit was conducted at Aga Khan University Hospital, Karachi, and comprised data of all patients who presented with neck of femur fracture from 1995 to 2014. Patients with open fractures and those having external fixators were excluded. Data was retrieved from the hospital database, and analysed using SPSS 17.

Results: Records of 1039 patients were reviewed. The proportion of patients in the 70+ years age group significantly increased from 45% to 52% over the two decades (p=0.033). Proportion of patients undergoing total hip replacement increased by more than 3 times from 2.6% to 8% (p<0.001).Internal fixation was the most common procedure in patients aged <50 (p<0.001), and hemiarthroplasty for those aged >50 years (p<0.001). Total hip replacement was seen in its highest proportion (15%) in patients aged 40-49 years (p=0.006). Hemiarthroplasty showed a dramatic decrease in the age group 50-59 years (from 57% to 40%). Total hip replacement showed a steady increasing trend over the last 20 years, most prominently in people in their 50s and 60s (from 1% to 18%; p<0.001).

Conclusion: There is apparently a rising trend in number of patients presenting with neck of femur fracture. Total hip replacement has a rising trend and partial hip arthroplasties have a decreasing trend when it comes to treatment of neck of femur fractures.

Keywords: Fracture neck of femur, Intracapsular fractures, Internal fixation, Hemiarthroplasty, Total hip replacement, Management trends. (JPMA 65: S-163 (Suppl. 3); 2015)

Introduction

Hip fractures are common in the elderly and have consequences extending into the domains of medicine, rehabilitation, psychiatry, social work and medical economics. Despite improvements in patient care, advances in surgical technique and implant technology, hip fractures continue to pose a substantial economic burden on the medical systems in the developed and the developing world. In 1995, 15 European Union (EU) countries had about 382,000 hip fractures with an estimated care cost of 9 billion Euros.[1] Its estimated that about 250,000 hip fractures occur in the United States each year. The number of fractures is projected to double by 2050 as the population ages.[2]

There are several factors contributing to an ever-increasing number of femoral neck fractures, including an increased patient lifespan, activity level and incidence of osteoporosis.[3] The decrease in bone mass in the elderly is caused by a number of factors including reduced function of osteoblasts, increased osteoclast activity, reduced physical activity, genetic predisposition, decreased calcium intake and hormonal influences.[3] This results in bone resorption outpacing bone building. Postmenopausal women are especially at risk because of oestrogen deficiency.[3]

Surgical treatment has been established as the gold standard, with the main aim being early mobilisation in order to prevent morbidity associated with recumbency. However, choice of the surgical option remains a topic of debate. Surgical options mostly revolve around internal fixation, hemiarthroplasty (such as Austin-Moore) and total hip replacement (THR). Each of these has its own merits and demerits.

The current study was conducted to audit the trends in management of neck of femur fracture at our institution to see how the choice of surgical procedure is changing over time in relation to different age groups.

Materials and Methods

The retrospective audit was conducted at Aga Khan University Hospital, Karachi, and comprised data of all patients who presented with neck of femur fracture from 1995 to 2014. Patients with open fractures and those having external fixators were excluded.

Data was retrieved from the hospital database, and analysed using SPSS 17 Chi square test was used to compare categories. P<0.05 was considered statistically significant.

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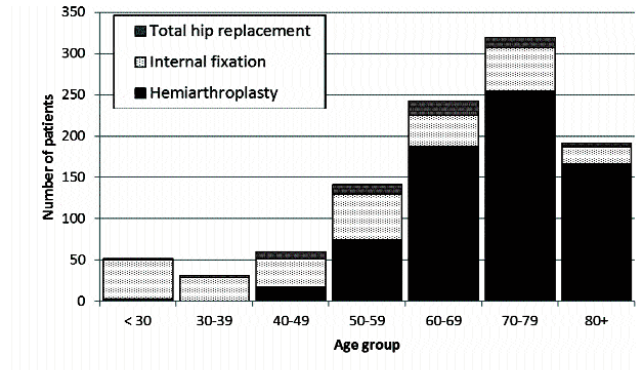
Results

Records of 1039 patients were reviewed. Hemiarthroplasty was the most common procedure in 68% patients (Table-1). Internal fixation was the most common procedure in patients aged <50 (p<0.001), and hemiarthroplasty for those aged >50 years (p<0.001). THR was seen in its highest proportion (15%) in patients aged 40-49 years (p=0.006) (Figure-1).



	< 30	30-39	40-49	50-59	60-69	70-79	80+
T.H.R.	4%	6%	15%	8%	7%	4%	3%
Internal fixation	90%	90%	55%	39%	15%	16%	10%
Hemiarthroplasty	6%	3%	30%	53%	77%	80%	87%

Figure-1: Stacked bar chart and data table depicting age distribution and proportion of each procedure within age groups. Significantly higher proportion of patients aged <50 years underwent internal fixation (76%; p<0.001), while those aged >50 years underwent hemiarthroplasty (76%; p<0.001). A narrow bracket (15%) of patients aged 40-49 years underwent total hip replacement (THR) in a significantly higher proportion (p=0.006) than other age groups.

The age group forming the highest proportion was 70-79 years, accounting for 31% patients (Table-2). However, there was a shift in the age towards older age group over the 20-year study period. The proportion of patients in the 70+ age group compared to <70 group significantly increased from 45% to 52% (p=0.033).

In terms of choice of procedure, internal fixation remained more or less consistent across the years, being more common in yourngger age groups (Figure-2). Hemiarthroplasty showed a decreasing trend below 70 years. The greatest decrease was in the 50-59 age group, decreasing from 57% to 40%. THR showed an increasing trend. In the last 10 years THR increased from 2.5% before 2010 to over 12.9% after 2010 (p<0.001). The increase was the greatest in patients in their 50s and 60s; from 1% to 18% (p<0.001).

Gender distribution did not show any change over time, with

Table-1: Hemiarthroplasty was the most common procedure in 68% patients.

Characteristic	n (%)
Gender	
Male	476 (46%)
Female	563 (54%)
Year	
1995-1999	199 (19%)
2000-2004	231 (22%)
2005-2009	283 (27%)
2010-2014	326 (31%)
Procedure	
Hemiarthroplasty	707 (68%)
Internal fixation	272 (26%)
Total hip replacement	60 (6%)

Table-2: Differences in age groups over time. Proportion of older patients (70+ years) is increasing across the time periods.

Age group	1995-1999	2000-2004	2005-2009	2010-2014
< 30	8(4%)	11(5%)	14(5%)	19(6%)
30-39	6(3%)	11(5%)	4(1%)	10(3%)
40-49	14(7%)	16(7%)	12(4%)	18(6%)
50-59	23(12%)	34(15%)	42(15%)	42(13%)
60-69	58(29%)	54(23%)	63(22%)	68(21%)
70-79	49(25%)	73(32%)	98(35%)	100(31%)
80+	41(21%)	32(14%)	50(18%)	69(21%)

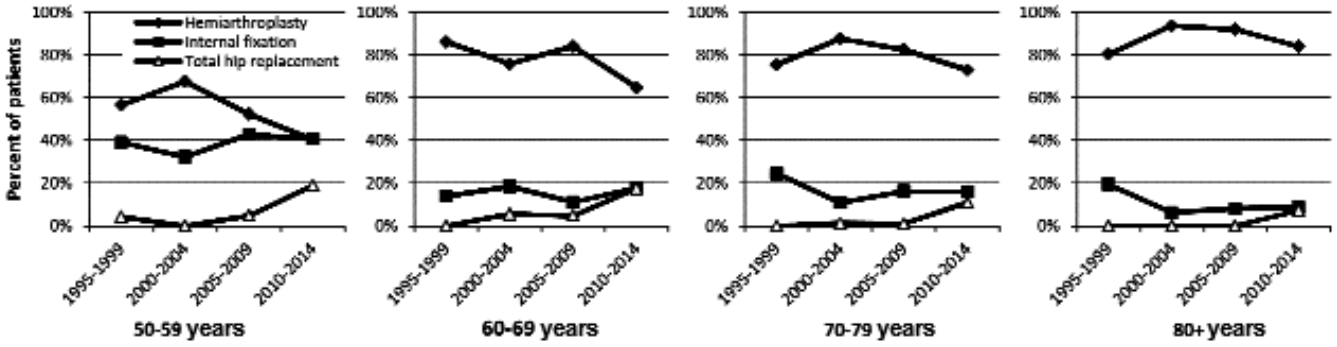


Figure-2: Trend of choice of procedure across 20 years, according to age group. In the 50s internal fixation was done in about 40% patients, while in the >80 age group hemiarthroplasty remained the most common procedure. In 50s and 60s, there was a progressive increase in proportion of total hip replacement (THR) (from 1% to 18%; p<0.001) and a corresponding decrease in proportion of hemiarthroplasty (78% to 55%; p<0.005).

slight female preponderance by about 4-8%. Proportion of patients undergoing internal fixation and hemiarthroplasty decreased by 8% and 5% respectively (p>0.05). On the other hand, proportion of patients undergoing THR increased by more than 3 times from 2.6% to 8% (p<0.001).

Disscussion

Our study showed that in patients presenting with neck of femur fractures there was a progressive rise in the proportion of patients undergoing THR, and a fall in the proportion of hemiarthroplasty. There has conventionally been a single factor that determined surgical treatment of these injuries: whether the fracture is displaced or not. When fractures are relatively undisplaced they are fixed and when displaced, hemiarthroplasty was the recommended treatment. THR was seldom performed because of a higher dislocation rate compared to hemiarthroplasty[4-6] because of greater complexity and cost of the procedure. Internal fixation with cannulated screws is minimally invasive, simple and economical. However, the related complications of internal fixation, including possibility of avascular necrosis (AVN) or non-union (requiring revision surgery) and malunion (causing shortening and limp) are considerations against the choice of internal fixation, especially in the elderly.[7]

The procedure of Austin-Moore hemiarthroplasty is commonly carried out in all hospitals of Pakistan catering to patients with fractures,[8-10] but the long-term results of these patients has not been reported previously. According to a recent study,[11] Austin Moore arthroplasty has proved a good option in terms of low complication rate and an acceptable functional result (33% Excellent and 43% Good), though there was no comparison group in the study. Hemiarthroplasty may be done using either a monopolar or so called bipolar heads. The theoretical advantage of a bipolar head is that with two articulating surfaces, there is reduced friction upon the native acetabular cartilage, possibly leading to a slower progression of cartilage wear and lesser pain as well as lower dislocation rate.[12]

In the last few decades, there appears to be a trend towards THR because of evidence of better functional outcomes and a lower revision rate than hemiarthropalsty.[13-15] With the wide use of larger diameter heads and improving surgical techniques, the dislocation rate is going down. Abroad, it is becoming a common procedure for active people in middle and elderly age groups suffering from femoral neck fractures.

Conclusion

Internal fixation is the favoured option in patients below 50 years of age, though it is practised in all age groups. THR is becoming more common, especially in patients in their 50s and 60s. Hemiarthroplasty, which used to be the most common procedure in the elderly, is showing a decline in people aged less than 70 years. Better reported functional results after THR compared to hemiarthroplasty, and a general increase in recognition of the role of, and experience in, THR in fracture patients are likely to be responsible for this trend.

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