AN ORTHOPEDIC SURGEON SURVEY ON THE TREATMENT OF DISPLACED FEMORAL NECK FRACTURE: OPPOSING VIEWS

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OBJECTIVE: To examine the reasons for practice variation in the treatment of displaced femoral neck fractures.

DESIGN: A survey, asking surgeons to choose either hemiarthroplasty or internal fixation for 2 different female patients with a displaced femoral neck fracture.


PATIENTS: The scenario in the first patient was of an independent 70-year-old woman with no pre-existing medical conditions. The scenario in the second patient was of a housebound 84-year-old woman with co-morbidity.

MAIN OUTCOME MEASURES: Proportion of surgeons choosing either hemiarthroplasty or internal fixation for each case scenario. Distribution of reasons to explain the treatment decision.

RESULTS: Ninety-nine surgeons responded. For the case of the 70-year-old woman, 47% chose hemiarthroplasty and 53% chose internal fixation ($p = 0.60$), and for the 84-year-old woman, 96% chose hemiarthroplasty. These findings were consistent within the subgroups of teaching surgeons and community practice surgeons. Surgeons with 10 years or less of practice tended to favour hemiarthroplasty whereas those with more than 15 years’ practice favoured internal fixation. Important reasons for treatment choice were avoidance of reoperation in the hemiarthroplasty group (85%) and better hip function in the fixation group (83%), durability (83%) and ease of revision (77%).

CONCLUSION: The surgeon’s interpretation of the importance of reoperation and function underlies the differences in treatment decision regarding the management of femoral neck fractures in elderly patients.

OBJECTIF : Analyser les raisons pour lesquelles la méthode de réduction des fractures du col du fémur avec déplacement varie dans la pratique.

CONCEPTION : Sondage dans le cadre duquel on a demandé aux chirurgiens de choisir l’hémiarthroplastie ou la fixation interne chez deux patientes différentes qui ont d’une fracture du col du fémur avec déplacement.


PATIENTES : Dans le premier cas, le scénario était celui d’une femme autonome de 70 ans qui n’avait aucun problème médical antérieur. Dans le deuxième, le scénario était celui d’une femme de 84 ans confinée à la maison et qui avait une comorbidité.

PRINCIPALES MESURES DES RÉSULTATS : Proportion des chirurgiens qui ont choisi soit l’hémiarthroplastie, soit la fixation interne, dans chaque cas. Répartition des raisons justifiant la décision.

RÉSULTATS : Quatre-vingt dix-neuf chirurgiens ont répondu. Dans le cas de la femme de 70 ans, 47 % ont choisi l’hémiarthroplastie et 53 %, la fixation interne ($p = 0.60$). Dans celui de la femme de 84 ans, 96 % ont choisi l’hémiarthroplastie. Ces résultats étaient uniformes dans les sous-groupes de chirurgiens qui enseignaient et ceux qui pratiquaient dans la communauté. Les chirurgiens comptant 10 ans ou moins de...
It is generally accepted that displaced fractures of the femoral neck in young adults are best managed by primary internal fixation. Because of the high rate of nonunion in patients older than 85 years, this fracture is most often treated by hemiarthroplasty. But how to manage the majority of patients between the ages of 65 and 85 years is controversial. Since 1975, over 100 studies have examined the treatment of femoral neck fractures. Of these, only a handful have been randomized trials or comparative studies and none have provided conclusive evidence on which method of treatment is appropriate for individual cases.

The extent of treatment variation for femoral neck fractures is exemplified in a number of studies. In the MEDOS study, a prospective multicentre study of the incidence of hip fractures in 6 Mediterranean countries, there was wide variation between centres in the use of arthroplasty, ranging from 9.5% in rural Turkey to 83% in Toulouse, France. In a recent study comparing treatment in The Netherlands and Sweden, 94% of displaced femoral neck fractures were treated with hemiarthroplasty in The Netherlands, whereas practically all were treated with internal fixation in Sweden. In Ontario there was a 9-fold variation (9% to 83%) in the use of hemiarthroplasty among counties where at least 1 femoral neck fracture was treated per month.

The main purpose of this study was to examine the reasons contributing to practice variation in the treatment of displaced femoral neck fractures. We also examined patient and clinical factors that may be important in decision-making.

**Methods**

**Sample**

The target population was Canadian orthopedic surgeons. To obtain a large enough sample, a questionnaire was included in the registration package of those who attended the 1995 Canadian Orthopaedic Association annual meeting in Halifax. In total, 320 packages were distributed at the conference. To maintain anonymity and impartiality in responses, we purposely omitted any tracking mechanisms in the survey form. Therefore follow-up was not possible, and participation was entirely voluntary.

**Survey**

The questionnaire polled orthopedic surgeons on their preferred treatment: either hemiarthroplasty or internal fixation. All analyses were performed using the statistical package STATA, version 4.0 (StataCorp., College Station, Tex.). Differences in the results were analysed by the Student’s t-test. A probability value of less than 0.05 was considered significant.

**Conclusion**

L’interprétation que le chirurgien a fait de l’importance d’une nouvelle intervention et du fonctionnement sous-tend les différences dans le choix de la méthode de réduction des fractures du col du fémur chez les patients âgés.
RESULTS

Response rate

Overall, 99 surgeons responded to the survey (Table I), for a response rate of 31%. Ninety-four percent of the respondents treated more than 10 hip fractures per year, and the median number of years in practice was 11. Approximately 61% of the respondents were associated with a teaching institution.

Case scenarios

There was almost universal agreement (95%) that the 84-year-old woman should be treated by hemiarthroplasty.

The results for the 70-year-old woman were more interesting: 46% chose a hemiarthroplasty and 54% chose internal fixation. When stratified by hospital affiliation, no significant difference (p = 0.60) in treatment choice was observed among surgeons from teaching and community hospitals (Table II). In addition, the 24% increase in use of hemiarthroplasty for a similar patient with a Garden grade 4 fracture is entirely due to surgeons who initially chose internal fixation for the Garden grade 3 fracture and changed their treatment choice to hemiarthroplasty.

Treatment choice by years in practice

When treatment choice by years in practice was examined for the 70-year-old woman, a clear pattern emerged (Fig. 2). Those in practice less than 10 years tended to favour hemiarthroplasty, whereas those in practice more than 15 years favoured internal fixation. However, the choice was evenly split among those in practice for 11 to 15 years.

Reasons for treatment choice

The most frequently quoted reason for choosing a hemiarthroplasty for the 70-year-old patient was “it is less likely to result in a second operation” (85%). Early mobilization (66%) and early function and pain relief (64%) also figured highly in this decision (Table III). Two reasons for choosing internal fixation for the 70-year-old woman rated highly: “hip function after successful fixation is better” (83%) and durability of a successful result (83%). Ease of revision to a hemiarthroplasty or total hip replacement was also important (77%).

Although 95% chose a hemiarthroplasty for the 84-year-old patient, the reasons for choosing this procedure differed, depending on whether the surgeon chose hemiarthroplasty or internal fixation for the 70-year-old pa-

Table I

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>No. (%)</th>
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<tbody>
<tr>
<td>No. of hip fractures treated per year</td>
<td></td>
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<tr>
<td>&lt; 10</td>
<td>6 (6)</td>
</tr>
<tr>
<td>&gt; 10</td>
<td>88 (94)</td>
</tr>
<tr>
<td>Hospital affiliation</td>
<td></td>
</tr>
<tr>
<td>Teaching</td>
<td>57 (61)</td>
</tr>
<tr>
<td>Large community</td>
<td>22 (23)</td>
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<tr>
<td>Small community</td>
<td>15 (16)</td>
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<tr>
<td>Years in practice†</td>
<td></td>
</tr>
<tr>
<td>1-5</td>
<td>26 (27)</td>
</tr>
<tr>
<td>6-10</td>
<td>19 (20)</td>
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<tr>
<td>11-15</td>
<td>12 (12)</td>
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<tr>
<td>16-20</td>
<td>11 (11)</td>
</tr>
<tr>
<td>&gt; 20</td>
<td>29 (30)</td>
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</tbody>
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*94 respondents

FIG. 1. Garden classification, which is based on the relationship of the medial trabeculae (compression trabeculae) in the femoral head and pelvis. I = grade 1, incomplete fracture; II = grade 2, complete fracture not displaced; III = grade 3, complete fracture displaced less than 50%; IV = grade 4, complete fracture displaced more than 50%. (Reprinted from Schatzker J, Tile M, editors. The Rationale of Operative Fracture Care, 2nd ed, Fig. 14.6, page 330, 1996, by permission of Springer-Verlag, New York.)
tient. Of the surgeons who chose hemiarthroplasty for the 70-year-old patient, 71% indicated that the reason this was also indicated for the 84-year-old patient was that “early function and pain relief are better” with hemiarthroplasty. On the other hand, of those who chose internal fixation for the 70-year-old patient and hemiarthroplasty for the 84-year-old patient, only 43% indicated that “early function and pain relief are better” was an important reason for choosing this procedure in the 84-year-old patient.

**Patient factors**

Irrespective of the treatment choice for the 70-year-old patient, surgeons tended to agree on the importance of good pre-fracture walking ability (73%) and independence (71%), presence of comorbidity (77%) and dementia (74%) as important prognostic indicators. The other factors that were also rated highly were osteoporosis (63%) and comminution of the fracture (63%).

**DISCUSSION**

There was almost unanimous agreement that the 84-year-old patient should be treated with a hemiarthroplasty. However, there was a clear difference in opinion for the treatment of the 70-year-old patient, with a virtual 50–50 split. Surgeons with 10 years or less of practice tended to favour hemiarthroplasty whereas those with more than 15 years of practice favoured internal fixation.

Approximately 24% of surgeons who chose internal fixation for the Garden grade 3 fracture would change to a hemiarthroplasty if faced with a Garden grade 4 fracture. This implies a belief that there is a significant difference in the rate of failure between the two grades of fracture after internal fixation. Yet the published 2-year rates of failure in women for Garden grades 3 and 4 femoral neck fractures are 29% and 55% respectively. The fact that there is a significant reoperation rate (30%) associated with internal fixation, is well supported in the literature. For the surgeons preferring internal fixation, the choice would seem to be for the hope of superior hip function and durability, trading this for an inevitably high reoperation rate within the first 2 years. Conversely, the important consideration for surgeons preferring hemiarthroplasty seems to be the avoidance of early reoperation within the first 2 years. The trade-off is the need to revise a proportion of these procedures to total joint arthroplasty some 5 to 10 years later because of pain or loosening of the prosthesis. Given that 30% of hip fracture patients die within the first year after fracture, this signifi-
cantly reduces the number requiring a late revision procedure.

Almost all surgeons agreed on the general patient and pathological factors that should be considered in managing femoral neck fractures. Yet, our findings imply that 2 surgeons seeing the same patient, having the same knowledge base and considering the same factors may make entirely different treatment choices. Although there is agreement on these factors, surgeons differ in their interpretation of how these factors influence outcome in a clinical setting.

The limitations of this study need to be addressed. First, the generalizability of our findings is limited to the opinions of orthopedic surgeons and not general surgeons, who may care for some of these patients. Second, we note that 61% of respondents were from teaching institutions. Since there was no correlation between practice setting and treatment choice, our results should be generalizable to all orthopedic surgeons treating hip fracture patients. Third, a relatively low response rate of 35% was achieved. However, 93% of respondents treated at least 10 femoral neck fractures per year, so they are surgeons who are well acquainted with this injury. A response rate of 30% is standard for a survey with no “follow up” of respondents.22 We intentionally decided to forgo follow-up because absolute anonymity in respondents was important in preserving data integrity.

In conclusion, a major factor driving surgeon preference seems to be the view of the impact of reoperation on these patients. Those preferring hemiarthroplasty for the 70-year-old patient saw avoidance of reoperation as an important consideration, whereas those preferring internal fixation did not view reoperation with such negativity. The physical function and overall clinical and radiographic results of these revised cases also need to be addressed in another study. This study underscores the need for a randomized trial to determine whether internal fixation or hemiarthroplasty is the optimal treatment for displaced femoral neck fractures in patients between the ages of 65 and 79 years.

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### References


