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Research Paper

Changes in rehabilitation outcomes by new guidelines of Hong Kong Hospital Authority in implant choice for femoral neck fractures—Austin Moore versus cemented Exeter hemiarthroplasty 因應香港醫院管理局對股骨頸骨折假體選擇的新指引而對其復康成果的轉變 — 奧斯汀摩爾 (Austin Moore) 與骨水泥埃克塞特 (Exeter) 半髖關節置換術的比較



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ABSTRACT

Background: In 2013, Hospital Authority of Hong Kong replaced Austin Moore Arthroplasty (AMA) with cemented Exeter hemiarthroplasty for displaced femoral neck fractures. This study evaluated whether this new guidelines resulted in better mortality, hospital service reattendances and rehabilitation outcomes. **Methods:** Patients aged 65–84 years with hemiarthroplasty done in a tertiary hospital during 2012–2014 were reviewed retrospectively. AMA group included AMAs carried out during years 2012–2013, and Exeter group included cemented modular Exeter hemiarthroplasties carried out during years 2013–2014. All patients were followed-up for 2 years.

Results: The Exeter group performed significantly better in rehabilitation outcomes than AMA group in terms of mobility score, independent and outdoor walking and community dwelling. They also had less hospital service reattendances due to falls, refractures and implant-related causes. There was a trend towards lower mortality in the Exeter group with increasing duration from operation.

Conclusion: The new guidelines in replacing AMA with cemented Exeter hemiarthroplasty resulted in better patient outcomes.

摘要

背景: 香港醫院管理局於2013年以Exeter骨水泥半髖關節置換術代替Austin-Moore非骨水泥半髖關節置換術(AMA)作為移位髖頸骨折之首選儀器。此論文檢討這個新指引會否改善病者的死亡率、再度使用醫院服務、和復康成果。

方法: 我們回顧性研究於2012–2014年間在一間三級醫院內因髖頸骨折進行半髖關節置換術，年齡介乎65–84歲的病者。AMA組包括了於2012–2013年間進行的Austin-Moore非骨水泥半髖關節置換術，而Exeter組則包括於2013–2014年間進行的Exeter骨水泥半髖關節置換術。所有病者均追蹤至術後兩年。

結果: Exeter組較AMA組在復康成果中有顯著的優勢，尤其是行動指數、獨立行動及戶外行動能力、及社區居住能力。Exeter組亦顯著較少因為跌倒、再骨折及儀器有關的原因再度使用醫院服務。隨著手術後的時間越長，Exeter組亦有趨勢有較低的死亡率。

結論: 香港醫院管理局年以Exeter骨水泥半髖關節置換術代替Austin-Moore非骨水泥半髖關節置換術的新指引改善了病者的結果。

Introduction

Geriatric hip fracture is a global endemic due to ageing population and associated osteoporosis. In Hong Kong, most hip

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Table 1
Basic epidemiology characteristics between AMA and Exeter groups.

Characteristics	AMA group (n = 150)	Exeter group (n = 130)	p value
Year of operation			
2012	99		
2013	51	33	
2014		97	
General health			
Age	77.60	76.74	0.758
Preoperative CACI	4.80	4.89	0.427
Preoperative ASA	2.33	2.38	0.068
Premorbid function			
Preoperative MFAC	6.17	6.40	0.148
Preoperative ambulatory	100%	100%	
Preoperative unaided walking	52.67%	62.31%	0.104
Preoperative independent walking	91.33%	96.15%	0.101
Preoperative outdoor walking	80%	86.15%	0.173
Preoperative community dwelling	93.33%	95.38%	0.461
Operation delay			
Actual hours of from admission	31.17 h	35.22 h	0.252
Proportion of operation >48 h	86%	80%	0.180
Treatment period			
Total length of hospital stay	29.46 d	30.35 d	0.762
Length of stay in acute hospital	10.48 d	12.11 d	0.027
Proportion to rehabilitation hospital	64%	60%	0.491
Length of stay in rehabilitation hospital	18.98 d	18.24 d	0.820
Proportion to outpatient rehabilitation (geriatric day hospital)	74%	70%	0.457
Duration of outpatient rehabilitation	6.44 wk	6.12 wk	0.580

AMA = Austin Moore Arthroplasty; ASA = American Society of Anesthesiologists; CACI = Charlson age-adjusted comorbidity score; MFAC = Modified Functional Ambulation Classification.

The italic format mean they are statistically significant.

fractures are managed in public hospitals under governance of Hospital Authority. According to the statistical report of Hospital Authority Management Information Portal, hip fracture operations have been slowly increasing from around 4500 cases in 2011 to around 4800 in 2016. It constitutes one of the commonest orthopaedic operative diagnoses in Hospital Authority.

Hip fracture causes significant impacts on patients' lives. It is associated with increased mortality, up to 30% in the first year.^{1–3} It results in loss of functions including ambulation, independence in daily lives, social participation and living in community.^{4–6} It has high costs on our health-care system, with the necessary hospitalisation, outpatient rehabilitation and subsequent medical care needs. Average hospital bed days for hip fracture are 7 days in acute and 20 days in rehabilitation hospitals, with cost of care per day of approximately USD 400, total hospital cost per admission around USD 10782 and a total annual expenditure in Hospital Authority around 52 million USD.^{6,7} Therefore, every effort should be made to improve functional outcomes after hip fractures.

For displaced femoral neck fracture, hemiarthroplasty is the treatment of choice. The traditional Austin Moore Arthroplasty (AMA) has been widely used since 1950s^{8,9} and remains in regular

use worldwide nowadays.^{10,11} However, there is an international trend to replace AMA with cemented hemiarthroplasty. Bone cement provides immediate and long-term stability, resulting in less thigh pain and better implant survival and long-term function.^{12–19}

In view of potential advantages in pain, function and implant survival of modern cemented Exeter implant over conventional AMA, the Hospital Authority of Hong Kong has adopted new guidelines for implant choice of femoral neck fractures since 2013. For patients aged 65–84 years, cemented modular hemiarthroplasty with Exeter stem would be used instead of AMA. Bipolar femoral head would be used for patients aged 65–74 years and unipolar head for patients aged 75–84 years.

This study reviewed whether the new guidelines improved patients' rehabilitation outcomes, in terms of mortality, hospital service reattendances and functions.

Methodology

We retrospectively reviewed a consecutive cohort of patients aged 65–84 years, admitted to a single tertiary hospital in Hong

Table 2
Modified Functional Ambulation Classification (MFAC).

MFAC class	Stage	Definition
1	Lyer	Patient cannot ambulate and requires manual assistance to sit or is unable to sit for 1 min without back or hand support, with the bed or plinth height allowing hips, knees and ankles positioned at 90° and both feet flat on the floor
2	Sitter	Patient is able to sit for 1 min without back or hand support and is unable to ambulate with the help or only one person
3	Dependent walker	Patient requires manual contacts of no more than one person during ambulation on level surfaces to prevent falling. Manual contacts are continuous and necessary to support body weight as well as to maintain balance and/or assist coordination.
4	Assisted walker	Patient requires manual contacts of no more than one person during ambulation on level surfaces to prevent falling. Manual contacts are continuous or intermittent light touch is required to assist balance and/or coordination.
5	Supervised walker	Patient can ambulate on level surfaces without manual contact of another person, but for safety reasons, he/she requires standby guarding or verbal cuing of no more than one person.
6	Indoor walker	Patient can transfer, turn and walk independently on level ground but requires supervision or physical assistance to negotiate any of the following: stairs, inclines or uneven surfaces.
7	Outdoor walker	Patient can ambulate independently on level and nonlevel surfaces, stairs and inclines

This classification does not take account of any aids used.

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