Journal of Orthopaedics 13 (2016) 431–436

Contents lists available at ScienceDirect

Journal of Orthopaedics

journal homepage: www.elsevier.com/locate/jor

Original Article

Chronic hip dislocations: a rarity. How should we treat them?

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ARTICLE INFO

Article history:
Received 25 January 2016
Received in revised form 22 July 2016
Accepted 2 September 2016
Available online

Keywords:
Chronic
Hip dislocation

ABSTRACT

Background: Chronically dislocated hips (>6 weeks) are usually the consequence of difficulties accessing appropriate healthcare in a timely fashion after dislocation; this explains why they are more common in developing countries. Due to a lack of research, there is currently no consensus on the best treatment available for patients presenting with this condition. Therefore, it is important to assess the treatments available so as to ensure that doctors adequately manage those presenting with this debilitating condition in the future.
Objective: To identify the best treatment strategy for chronic hip dislocations based on the treatment outcomes achieved by a free surgical clinic in Phnom Penh, Cambodia.
Patients and method: A retrospective analysis of the surgical centre's electronic records was conducted. Patients presenting with hips dislocated for >6 weeks were included whilst congenitally dislocated hips were excluded. Treatment outcomes, based on follow up notes, were then assessed. Data abstracted during chart review was analysed using descriptive and comparative statistics.
Results: 72 patients presented to the clinic with chronic hip dislocations. 42 patients received recorded treatment and 32 were followed up. Among patients with follow-up, 63% experienced 'good' outcomes after treatment. Open reductions, the most common treatment, were successful 65% of the time. The use of preoperative traction increased the success of open reductions by 13%, however, this result was not statistically significant ($p = 0.64$).
Conclusion: Open reductions with pre-operative traction seem to be an acceptable treatment in this setting.

1. Introduction

Dislocated hips are treated as emergencies in developed countries. When reduction of the hip is delayed, the femoral head migrates proximally, causing a leg length discrepancy while compromising vascular supply from the foveolar artery and the anastomosis of vessels from the femoral circumflex arteries. Possible complications stemming from the delay of treatment include avascular necrosis of the femoral head, degenerative arthritis, ankylosis, and sciatic nerve injury.[1–4] It has been shown that earlier reductions are associated with better clinical results.[5,6]

Chronically dislocated hips (>6 weeks) are a rarity in many regions of the world where there is rapid access to healthcare; this has resulted in scarcity of recent scholarship assessing the treatments available for this condition. As chronically dislocated hips are more common in Cambodia, the aim of this study was to assess which treatment approaches provided at a free NGO clinic in Phnom Penh, Cambodia, have yielded the best outcomes for patients, in order to help guide the future practice of doctors who do encounter this problem.

2. Materials and methods

2.1. Case identification (data abstraction)

The surgical centre's Electronic Medical Record (EMR) system, which includes records from 2008, was used to conduct a retrospective analysis of patients that had presented to the clinic

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http://dx.doi.org/10.1016/j.jor.2016.09.002
0972-978X/

with chronic hip dislocations. Because English is not the first language of many of the surgeons, a variety of search terms were used to cover potentially misspelled diagnoses for 'hip dislocation' when searching for patients.

EMR patient histories were reviewed and only patients presenting with dislocations >6 weeks old were included in the study. This interval is greater than that used by Garrett (>72 h) in another paper considering chronically dislocated hips, however, no consistent standard exists for defining chronicity.[7,8] Additionally, congenital hip dislocations were excluded.

The records of patients included in the study were then examined and the following data abstracted: patient demographics, injury aetiology, the time delay between dislocation and presentation, preoperative treatment approach (traction vs. none), operative treatment approach, and follow up notes.

2.2. Data analysis

Statistical analysis consisted of descriptive statistics for demographic characteristics, aetiology, delay between dislocation and presentation to clinic and treatment outcomes (patients were divided into subgroups based on the type of treatment they received for the last two).

Fisher's exact test was used to assess whether there was a difference in the sex ratio of treated patients.

A one-way analysis of variance (ANOVA) was used to detect whether the delay between dislocation and presentation to the clinic differed significantly between patients who received different treatments at the centre; closed reduction, open reduction, arthrodesis or total hip replacement (THR) were analysed. Each of these treatments had been used to treat three or more patients included in the study; this frequency of use enabled them to be selected for analysis. Post hoc ANOVA analysis was performed using Tukey's honest significance test and Bartlett's test of homogeneity of variance.

Operation outcomes, based on follow-up notes and radiographic evidence discovered during chart review in EMR, were used to compare the success of the varying treatments.

Data abstracted during chart review was insufficient to reliably stratify according to Epstein criteria, Garrett criteria, or Oxford Hip Score[7,9,10] which the few other papers examining chronic hip dislocations have used to assess treatment outcomes. Both the Garrett and Epstein criteria used non-interval, ordinal grades.[7] Like these scoring systems, we decided to use categorical measures to simplify outcome analysis; operative outcomes were divided into 'bad' and 'good' grades.

A 'bad' outcome was defined by presence of one or more of the following postoperatively: need for a revision operation, postoperative dislocation, a limited range of movement (ROM) significant enough to affect daily life (work/household activities), positive Trendelenburg sign or postoperative necrosis of the femur. Pain, a limited ROM not affecting daily living and long-term use of crutches were not considered bad outcomes. While these are not considered good outcomes in more developed countries where acute dislocations are treated promptly, we accepted that the chronicity of the presenting complaint prevents the same postoperative outcomes being achieved in patients in developing countries. 'Good' outcomes were defined by the absence of follow up complications that made an outcome bad (described above). The frequency of good and bad outcomes for the different treatments used was then compared.

Descriptive statistics were also used to analyse pre-operative treatment; the number of days patients spent in traction (patients were again divided into groups based on the treatment they went on to receive) and the weights used at the beginning and end of traction were examined.

A Welch two-sample t-test was used to determine whether the delay between dislocation and presentation differed significantly between patients with and without preoperative traction, both for all surgeries and for the restricted subgroup of patients treated with open reduction. Next, Fisher's exact test was used to determine differences in the number of good outcomes between patients with and without traction prior to open reduction. Statistical significance for all tests was defined at $p < 0.05$. All statistical analysis was performed using R version 3.1.1.

3. Results

72 patients presented to the clinic with chronic hip dislocations. The average age of these patients was 27 and a statistically significant majority (71%, $p = 0.02$) were males. The major causes of these dislocations were falls (36 cases) and motor vehicle accidents (MVA) (17 cases).

Of the 72 patients that presented, 42 proceeded to have treatment at the hospital. The average delay from dislocation to presentation for these patients was 18 months (range 6 weeks to 13 years). Ten of the patients receiving treatment were not followed up. For the 32 patients that remained, the average time from treatment (operation) to the last follow-up was 11 months (range 20 days to 39 months). Five of the 10 patients lost to follow-up had good postoperative outcomes noted in their records before discharge.

A variety of operations were used to treat the dislocated hips presenting to the clinic. Closed reductions were predominantly used for patients presenting with hips which had been dislocated for a short period of time (mean = 1.9 months) (Table 1); open reductions were used to treat hips which had been dislocated for a mean of 7.5 months longer than those for which closed reductions were used. Total Hip Replacement (THR) was only attempted as a first line treatment for hips that had been dislocated for longer periods (mean = 10 years). The delay before surgeons opted for THR was statistically significant when compared to open reduction, closed reduction, and arthrodesis using ANOVA and Tukey's range test ($p < 0.0001$). Bartlett's test of homogeneity of variance showed that the subgroup samples were non-normally distributed ($K^2 = 48$, df = 3, $p < 0.0001$). When Welch's t test was used to compare the delay to treatment between open and closed reductions, closed reduction was associated with shorter delays (-0.64 to -14.48, 95% CI, $p = 0.03$).

Fig. 1 highlights the outcomes of the different operations used to treat the dislocated hips. The most common operations were open reductions ($n = 24$) and closed reductions ($n = 7$). If only patients for which there is follow-up data are considered, 63% of all chronic hip dislocations treated had good outcomes and open

Table 1
Table showing the delay between hip dislocation and presentation to clinic for patients receiving various forms of treatment. (Delay to presentation data for two of the seven patients treated with closed reductions could not be found in the medical records).

Treatment (operation)	Number of patients	Delay between dislocation and presentation (months)	
		Mean	Range
Closed reduction	7	1.9	1.5–2
Open reduction	24	9.4	1.5–72
Arthrodesis	4	10	5–14
THR	3	120	48–156
Hemiarthroplasty	1	11	11
Osteotomy	1	60	60
Arthroplasty	1	11	11
Bone graft	1	3	3
Overall	42	18	1.5–156