

Door to relocation time for dislocated hip prostheses: a multicentre comparison of emergency department procedural sedation versus theatre-based general anaesthesia

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ABSTRACT

Background: Dislocation of a hip prosthesis is a painful event which has an incidence of 4% for primary total hip arthroplasty. Relocation is traditionally performed under general anaesthesia in the operating theatre, but relocation using sedation in the emergency department (ED) has been reported, with a limited success rate of 62%. A study was undertaken to compare door to relocation times for ED sedation and theatre general anaesthesia.

Methods: The notes of all patients attending five centres in the south west of England with prosthetic hip dislocation over a 12-month period between 2005 and 2006 were retrospectively reviewed using standardised data collection forms.

Results: Successful ED reduction was significantly quicker than failed ED reduction and theatre-based general anaesthesia (2 h 21 min vs 8 h 32 min; $p < 0.001$). No statistical difference was found between failed ED reduction and theatre general anaesthesia.

Conclusions: Reduction of dislocated hip prostheses in the ED saves nearly 6 h compared with theatre-based general anaesthesia and is therefore advocated.

METHODS

Data were collected from five centres in south-west England: Bristol Royal Infirmary (BRI), Derriford Hospital, Frenchay Hospital, Musgrove Park Hospital (MPH) and Royal Devon & Exeter (RD&E) Hospital. One researcher in each centre retrospectively reviewed the notes of all patients attending with prosthetic hip dislocation over a 12-month period between 2005 and 2006. Standardised data collection forms were used. Statistical analysis found time to be log normal and was modelled using a fixed and random effects model in which centre was fitted as a random effect and procedure fitted as a fixed effect. A Scheffe post hoc test was used to investigate where statistical significance lay when procedure type was found to be statistically significant.

RESULTS

Complete data were available for 165 of the 202 patients identified; 37 patients were excluded from the study (no arrival time recorded for 2, no ED sedation time recorded for 20, no theatre general anaesthesia time recorded for 12, and 3 with inadequate data for analysis).

The results for individual centres and collective data are shown in table 1. Successful ED reduction was significantly quicker than both failed reduction in the ED and general anaesthesia in the theatre ($p < 0.001$). No statistical difference was found between failed ED reduction and general anaesthesia in the theatre ($p = 0.53$).

Table 2 shows the sedative strategy used at each centre. Midazolam and propofol were the only sedatives recorded, with a success rate of 64% and 96%, respectively. In eight cases the sedative was not recorded.

DISCUSSION

This study demonstrates a clear benefit to patients in terms of successful relocation in the ED compared with general anaesthesia in the theatre, saving the patient nearly 6 h of discomfort (8 h 10 min versus 2 h 21 min). Furthermore, a failed ED reduction does not delay the final reduction in theatre.

Only one centre (Derriford) did not attempt ED reduction in the majority of patients. On further enquiry the decision regarding ED reduction is made by the duty emergency physician. Two centres (Frenchay and RD&E) offered propofol sedation in the ED to some patients, although the

Dislocation of a hip prosthesis is a painful event which has an incidence of 4% for primary total hip arthroplasty.¹ Relocation is traditionally performed under general anaesthesia in the operating theatre. Relocation using sedation in the emergency department (ED) has been reported previously,² with a limited success rate of 62%. The same paper reported a mean time for attempted ED relocation of 1.83 h compared with 10.9 h for general anaesthesia in the theatre. Early relocation reduces the time that a patient is required to wait in discomfort for definitive treatment.

We wished to explore whether the reported delay was common to other centres. Our primary objective was therefore to compare door to relocation times for sedation in the ED and general anaesthesia in the theatre. Secondary objectives were to identify:

- ▶ whether the service provided in each hospital was different;
- ▶ whether unsuccessful attempts at reduction in the ED result in significant delay compared with general anaesthesia in the theatre without reduction in the ED;
- ▶ relocation success rates in the ED for each centre and collectively;
- ▶ drugs used for sedation in the ED and their association with relocation success.

Table 1 Door to relocation time for dislocated hip prostheses (median and geometric mean times displayed in hours and minutes)

	BRI		Derriford		Frenchay		MPH		RD&E		Collectively	
	Median (mean)	n	Median (mean)	n	Median (mean)	n	Median (mean)	n	Median (mean)	n	Median (mean)	n
ED reduction	3 h 52 min (2 h 49 min)	14	2 h 46 min (2 h 45 min)	13	2 h 31 min (2 h 15 min)	20	1 h 44 min (1 h 49 min)	12	2 h 1 min (1 h 51 min)	33	2 h 21 min (2 h 10 min)	92
Failed ED reduction, then theatre GA	7 h 12 min (6 h 52 min)	7	6 h 14 min (7 h 50 min)	10	11 h 20 min (11 h 40 min)	10	7 h 5 min (6 h 48 min)	9	12 h 38 min (14 h 9 min)	7	8 h 32 min (9 h 0 min)	43
No attempt at ED reduction (theatre GA only)	24 h 32 min	1	8 h 10 min (7 h 19 min)	22	19 h 52 min (11 h 27 min)	3	4 h 16 min	1	5 h 24 min (5 h 40 min)	3	8 h 10 min (7 h 38 min)	30
ED success rate (%)	66.7		56.5		66.7		57.1		82.5		68	

BRI, Bristol Royal Infirmary; ED, emergency department; GA, general anaesthetic; MPH, Musgrove Park Hospital; RD&E, Royal Devon & Exeter Hospital.

Table 2 Success/failure data for reduction of dislocated hip prostheses in ED by drug used

		BRI	Derriford	Frenchay	MPH	RD&E	Collectively	Success rate (%)
		Midazolam	Success	11	13	9	11	23
	Failure	5	8	10	9	5	37	
Propofol	Success	1	0	11	1	9	22	96
	Failure	0	0	0	0	1	1	
Not recorded	Success	2	0	0	0	1	3	38
	Failure	2	2	0	0	1	5	

BRI, Bristol Royal Infirmary; ED, emergency department; MPH, Musgrove Park Hospital; RD&E, Royal Devon & Exeter Hospital.

selection criteria were not explored. The collective success rate for relocation with midazolam (64%) is in keeping with published experience.² The apparently superior performance with propofol (96%) is considered in our companion paper.³

This study is a retrospective chart review. The quality of the data collected is limited by both the precision of the original records and the extraction process. The information was extracted from the records by one individual in each centre, and this was not independently verified. The individuals collecting the data were aware of the aims of the study, which could have introduced bias.

Although these comparative data are interesting, our retrospective methodology considers association rather than causation. It seems likely that factors mitigating against sedation in the ED (such as profound patient co-morbidity) will also delay general anaesthesia in the theatre. Similarly, patients suitable for propofol sedation may be a group in whom relocation is technically easier for reasons other than the choice of sedative drug. Further prospective study, perhaps in the form of a randomised trial, is required to establish whether sedation with propofol in the ED is the optimal management strategy in this patient group.

CONCLUSIONS

Reduction of dislocated hip prostheses in the ED saves nearly 6 h compared with theatre-based general anaesthesia and is therefore advocated.

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Ethics approval: The local research ethics committee did not require formal review of this study.

Contributions: JG collated and analysed the raw data and co-wrote the paper. GS, NB, HS and SM collected the data from their respective emergency departments. LJ and JB advised and helped supervise the study; JB edited the paper. GL had the original idea, supervised the study, co-wrote the paper and acts as guarantor.

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