

ADVERSE PATIENT EVENTS RELATED TO SURGERY IN THE PRONE POSITION A 10 YEAR AUDIT OF A QA/QI DATABASE

Angelika Kosse MD, Shamantha Reddy MD and Apolonia E. Abramowicz MD
Department of Anesthesiology

INTRODUCTION

The inherent risk of surgery and anesthesia in the prone position is poorly quantified (1). Many interventions utilize the prone position, including spine surgery. Death rate for adults within 60 days of spine surgery is 2.0 per 1000 patients (2). The 2004-2007 Scoliosis Research Society database review of 108,419 cases identified 197 deaths; 23 are known to have occurred on the day of surgery but the date of death is known for only 48% of cases. We searched our departmental QA/QI database for adverse events in prone surgery patients in the past decade to characterize their types and outcomes.

METHODS

Between Jan. 1, 2003 and March 15, 2014 the database has a record of 3,484 events. With IRB approval, we queried it for the descriptive terms "prone" (57 events) and then "laminectomy" (additional 33 events), a total of 90 events. After excluding duplicates (8), non-prone cases (4) and pre-operative cancellations (5), we included 73 patients (75 events) in the analysis (2.2 % of all events).

We show the demographic data (Table 1) and event categories (Table 2).

The severity of an event was deemed "major" if it required either interruption of surgery, an unplanned return to the supine position or an unplanned increase in level of care (3). Mortality is shown separately.

RESULTS

The 5 deaths (6.8% of all prone adverse events) resulted from respiratory (2) and hemodynamic (3) causes – 1 surgical bleed, 1 PE and 1 heart failure. 5 of 6 ETT events were due to kinking/obstruction, 1 was a prone extubation. All were major. The most common event was related to mishaps with anesthesia and positioning equipment, followed by minor events due to facial skin and corneal abrasions. Respiratory problems were most common in the non-spine surgery patients, accounting for 1 death and 6 out of 8 major events.

TABLE 1

Demographics 73 patients 75 events	N (% of total)	Major Adverse Events N (% in category)	Mortality N (% in category)	Comments
Male	29 (40)	10 (34.4)	3 (4.1)	
Female	44 (60)	18 (40)	2 (4.5)	
Age (mean, range)	53 (0.5-82)	1 in peds group	none in peds	6 peds: 5 scol, 1 craniosynostosis
General Anesthesia	65 (89)	24 (36.9)	4 (6.2)	56 spine, 2 ERCP, 4 cran, 3 other
MAC	6 (8.2)	3 (50)	1 (16.7)	1 SC2, 2 ERCP
Regional Anesthesia	2 (2.7)	1 (50)		spinal/popliteal n.
Emergency	4 (5.5)			
ASA III	41 (56)	18 (43.9)	3 (7.3)	4 ASA I, 22 ASA II, 5 ASA IV, 1?

TABLE 2

Adverse Events	N (% of total)	Major Adverse Events N (% in category)	Mortality N (% in category)	Comments
Respiratory	10 (13.7)	8 (80)	2 (20)	1 postop. apnea, 1 ERCP MAC
ETT	6 (8.2)	5 (83.3)		
Hemodynamic	10 (13.7)	5 (50)	3 (30)	3 spine, 2 pts. ASA IV
Allergic reaction	5 (6.8)	3 (60)		
Equipment	16 (21.9)	4 (25)		miscellaneous
POVL	2			1 transient bilat., 1 partial unilat. PION
Neuro injury	3	2 (66.6)		1 median n., 2 cord
Awareness	1			during hypotension
iv access	2	1 (50)		TIVA sq
Skin/face/eyes	12 (16.4)			tape/prep/pressure related, corneal abr.
Tongue injury	4 (5.4)			MEP
Dental injury	3 (4.1)			1 bite-block related
Other	1 (1.4)			pt. dissatisfaction
Total	75	28 (38.6)	5 (6.8)	2 pts. - 2 events each

DISCUSSION

In 2013, approximately 52,000 anesthetics were performed in our institution, yet only 3484 adverse events were recorded in the previous decade. The adverse events in the database are primarily self-reported. There is no specific QA indicator for complications resulting from or related to patient position during surgery.

In the past 10 years, 75 events in 73 patients occurred in prone surgery patients.

The total low number of adverse events reported and the high prevalence of major events in our cohort could be due to under-reporting of minor adverse events, quality indicators not specific to complications from prone surgery and/or incomplete database search results.

Our analysis indicates that spine surgery cases under general anesthesia contribute most of the adverse events related to the prone position, however these tend not to be of respiratory nature.

In the hospital setting, non-spine prone cases under MAC or general anesthesia carry a risk of major adverse events.

CONCLUSION

From our audit and analysis of the complications related to procedures under anesthesia in the prone position reported to one QA database, we conclude that there is a need for indicators specific to positioning other than supine.

Patient safety initiatives should also take into account the relatively common, although not life-threatening, injuries to the skin, eyes and tongue.

Mishaps with anesthesia equipment and OR equipment, primarily used for patient positioning are a common problem.

Endotracheal tube-related events resulted in unplanned return to the supine position, which may result in other major complications, such as loss of lines and wound infection.

It is our hope that this preliminary audit will lead to the implementation of a registry of prone position-related adverse patient events.

REFERENCES

- Edgecombe H, Br J Anaesth. 2008; 100:165-83
- Smith JS et al. Spine. 2012; 37:1975-82
- Lubede B et al. J Spinal Disord Tech. 2010; 23:493-500