

Title: DOES THE USE OF METHYLMETHACRYLATE CEMENT INDUCE HEMODYNAMIC OR PULMONARY INSTABILITY?

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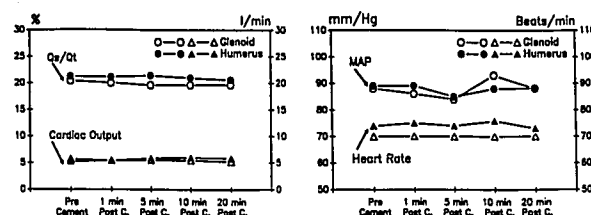
Introduction: The use of methylnmethacrylate cement in total hip replacements has been associated with peripheral vasodilation, myocardial depression, decreased arterial oxygen tension, increased pulmonary arterial pressure, and increased intrapulmonary shunt fraction (1,2,3,4,5). Since total shoulder replacement requires the fixation of a stemmed prosthesis into a long bone, similar hemodynamic and pulmonary changes may be seen. This study was designed to observe the cardiovascular and pulmonary effects of total shoulder replacement with a methylnmethacrylate cemented prosthesis.

Methods: Eight adult patients, ASA Class I-II undergoing total shoulder replacement gave written, informed, consent, for this IRB approved study. Radial artery, and pulmonary artery catheters were placed prior to induction of anesthesia. Anesthetic technique consisted of diazepam 5 mg P.O. for premedication, fentanyl 4-6 ug/kg, thiopental 4-6 mg/kg and succinylcholine 1.5 mg/kg for induction; vecuronium 0.08 mg/kg, enflurane ET conc. 0.6-1% and O₂ for maintenance. Systemic and pulmonary pressures, thermidulation cardiac outputs, and arterial and mixed venous blood gases were obtained at the following times: pre glenoid and humeral cement application 1,5,10, and 20 minutes afterwards. All

operations were performed with the patient in 60° upright position by the same surgeon. Data were analyzed using univariate and multivariate analysis for repeated measures.

Results: There were no significant changes in systemic arterial blood pressure, systemic vascular resistance, or cardiac output following cementing of either the glenoid or the humeral prosthesis. (Figure 1) The shunt fraction, Qs/Qt did not change significantly either. (Figure 2)

Discussion: Statistically significant hemodynamic or pulmonary changes did not occur during the use of methylnmethacrylate cement for the glenoid or humeral components of a total shoulder replacement. Although methylnmethacrylate has been demonstrated to be a direct vasodilator (1), the use of methylnmethacrylate for total shoulder replacements does not seem to pose the risks that have been seen with its use for total hip replacements.



References:

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4. Anesthesiology 42: 210-216, 1975
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TITLE: Decreasing Incidence of Anesthetic Cardiac Arrest

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The incidence of anesthetic cardiac arrest in 2 decades was compared to see whether increased safety awareness and enhanced monitoring in the 2nd decade were associated with fewer anesthetic cardiac arrests.

METHODS: Data from all cardiac arrests in the operating rooms of a large university hospital were collected over 20 yrs, 1969-1988, involving 241,934 anesthetics. Arrests caused primarily by anesthesia were identified and their cause (respiratory vs. nonrespiratory) and preventability (identifiable error) determined. Data from the 1st decade (1969-78) were compared with the 2nd (1979-88) using Fisher's exact test (significance: P<.05).

	'69-'78	'79-'88	P
Anesthetics No.	107,257	134,677	
Arrests No. (No./10,000 anesthetics)			
Total	22 (2.05)	14 (1.04)	0.032 *
Preventable	16 (1.49)	9 (0.67)	0.038 *
Respiratory	9 (0.84)	2 (0.15)	0.013 *
Nonrespiratory	7 (0.65)	7 (0.52)	0.246
Not Preventable	6 (0.56)	5 (0.37)	0.478

* denotes statistical significant (P < 0.05)

RESULTS: The incidence of all anesthetic cardiac arrests (Table) decreased by half in the 2nd decade compared to the 1st, as did that for preventable arrests. Neither the incidence of non-preventable arrests nor preventable nonrespiratory arrests changed significantly, whereas preventable respiratory arrests decreased significantly, suggesting that improved respiratory monitoring was effective. The 2 respiratory arrests seen in the 2nd decade occurred prior to the introduction of pulse oximetry in 1984. Since 1984, no preventable respiratory arrests have been seen.