TITLE: A COMPLETE REGIONAL ANESTHETIC TECHNIQUE FOR CARDIAC PACEMAKER INSERTION

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Introduction: Although the local infiltration anesthesia used by cardiologists for transthoracic pacemaker implantation procedures negates the need for administering general anesthesia to these usually very ill patients, toxic blood levels of local anesthetics may easily be reached in the former technique when additional injections are needed for inadequate analgesia. Also, the combination of large or uncontrolled dosages of local anesthetics with the usual multiple cardiovascular drugs, these patients take, could have potentially deleterious effects for the patient.[1] General anesthesia with a variety of myocardial depressant agents would also be potentially unwanted for these patients for the same reasons. We have developed a reliable regional anesthetic technique for the intraoperative management of patients undergoing cardiac pacemaker insertion.

Methods: Thirteen consecutive adult male patients (mean age = 65.9 yrs.; range: 58-90), who underwent implantation of a cardiac pacemaker for complete heart block, symptomatic bradycardias and sick sinus syndrome, comprised the study group. They received left-sided cervical plexus blocks as described by Moore[2] and Winnie.[3,4] Each patient received 5 to 10 mg diazepam, p.o. 90 minutes prior to receiving the regional block. Patients wre place in the dorsal recumbent position with heads turned towards the right. Intermittent aspiration tests were performed during injection, and each segment was evaluated by pin-prick after the blocks were in place. Each patient was monitored continuously for vital signs and ECG during placement of the block and throughout the procedure.

Results and Discussion: Our method, cervical plexus block plus intercostal nerve blocks at T_2, T_3 and T_4, yielded excellent anesthesia in all patients studied without the potential for serious adverse effects due to either inadvertent "field block" local anesthesia overdosage, or myocardial depression from general anesthetic techniques. (Table 1) Since in our institution the left subclavian vein is routinely chosen for cannulation, followed by the cephalic and external jugular veins in decreasing order of frequency, the regional anesthetic technique chosen must provide for a block of those sites directly involved, the clavicular area and superior pectoral region. Minimal anesthesia then, requires that the C_3, C_4, T_2 and T_3 dermatomes be blocked, with C_2 and T_4 blockade providing an extra, if somewhat limited, margin of safety. The skin incision most commonly occurs in an area corresponding to the C_4 dermatome, blocked by a cervical plexus block at the C_4 level. Upon completion of the procedure, all patients were questioned regarding pain or discomfort. None of the thirteen had experienced either or required supplemental anesthesia or analgesia to accomplish this maneuver. When the pocket was developed on the chest, in an area corresponding to the T_2 and T_3 dermatomes, no patients experienced pain or discomfort and no supplemental anesthetic agents were administered. By combining two routine regional nerve blocks, cervical plexus block with intercostal nerve blocks, we succeeded in developing a complete anesthetic technique for the management of pacemaker insertion under regional anesthesia. Our results indicate that this is a safe and effective method of producing anesthesia in a patient population which is inherently unstable and often times critically-ill. A 100% success rate paired with minimal adverse outcome indicates that the haphazard and dangerous practice of combining local with field block techniques supplemented with intravenous analgesics or inhalation agents ought to be abandoned.

References: 1) deCampo T, Pallares V: Cardiac pacemaker: A new indication for cervical plexus block. Regional Anesthesia, January-March, 1980, pp 20-21.
2) Moore DC: Regional Block, 9th Ed. Springfield, Illinois, Charles C. Thomas, 1971, pp 112-122.
3) Winnie AP, Rammamurthy S. Durrani Z, Radonjic R: Cervical plexus block simplified: A single injection technique. Anesth Analg 54:370-375, 1975.
4) Winnie AP: An "immobile needle" for nerve blocks. Anesthesiology 31:577-578, 1969.

(N=13)		
	#	%
INTRA-OPERATIVE ANALGESICS	0	0
INTRA-OPERATIVE PAIN	0	0
IMMEDIATE POST-OPERATIVE PAIN	0	0
INTRAVASCULAR INJECTION	0	0
INTRANEURAL INJECTION	0	0
DRUG OVERDOSE	0	0
ALLERGIC REACTIONS	0	0
PNEUMOTHORAX	0	0
SUBCUTANEOUS AND MEDIASTINAL EMPHYSEMA	0	0
DIAPHRAGMATIC PARALYSIS	0	0
HEMATOMA FORMATION	1	7.57
HOARSENESS	2	15.4
HORNER'S SYNDROME	2	15.4