COMPLICATIONS OF TEMPORARY TRANSVENOUS PACING

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SUMMARY

The complications of temporary transvenous endocardial pacing as performed in the University Hospital Kuala Lumpur, from 1971 to 1979 were reviewed. 125 temporary pacings were performed in 111 patients. Different routes of temporary pacing were used: namely percutaneous subclavian vein and femoral vein puncture and acutecubital vein cutdown. The latter route was associated with a higher incidence of dislodgement and infection. Other common complications encountered were ventricular arrhythymia and generator failure.

INTRODUCTION

Temporary transvenous demand endocardial pacing has been accepted as a safe and effective mode of therapy for heart block and other arrhythmias. [1-6]

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Several approaches to the central venous system have been reviewed by various authors who have advocated percutaneous puncture of the internal jugular, [7,8] subclavian, [9,10] femoral vein [11,12] or antecubital vein cutdown. [13] Although all of these approaches have advantages and disadvantages, little information is available for comparison of the complications associated with each route. The aim of this report is to review our complications with the various approaches to temporary transvenous pacing.

MATERIALS AND METHODS

The clinical records of all patients who received temporary transvenous pacemaker in the University Hospital Kuala Lumpur from 1971 to 1979 were reviewed. Multiple routes of insertion were used, including percutaneous subclavian and femoral punctures and antecubital vein cutdown. All temporary pacing insertions were performed in the cardiac catheterisation laboratory. Bipolar electrode catheters were used and the pacemakers were operated on demand mode. The catheter tip was positioned in the right ventricular apex under fluoroscopic control. The patients were thereafter monitored in the coronary care unit.

RESULTS

111 patients were reviewed. There were 64 males (58%) and 47 (42%) female patients. There were 49 Chinese, 33 Malay and 27 Indian, and two Caucasian patients. The ages ranged from 14 to 85 years.

125 temporary pacings were performed in 111 patients. The commonest route was percutaneous subclavian puncture, with 89 insertions (71.2%) performed. Antecubital cutdown accounted for 23 pacings (18.4%), while femoral vein puncture, 13 pacings, (10.4%). The duration of pacing is illustrated in Fig. 1 with the majority in the first two weeks.

The complications are as shown in Tables I and II. Common complications encountered were ventricular arrhythmia, dislodgement and infection. Table III shows the incidence of dislodgement which is commonest in the antecubital vein cutdown (31%).

Infection at the site of insertion is higher in the antecubital route (22%), and uncommon with subclavian (3%) and femoral vein puncture (1%).

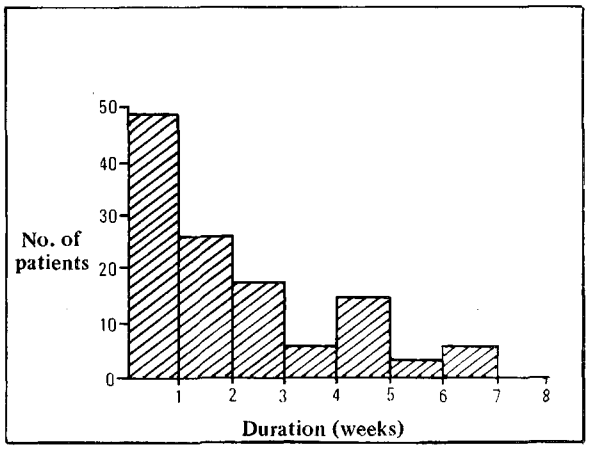

Fig. 1 Temporary transvenous pacing: duration of pacing.

TABLE I
TEMPORARY TRANSVENOUS PACING

Complications	Patients	Percentage
Arrhythmia		
Ventricular tachycardia/ fibrillation	13	10
Asystole	5	4
Ventricular ectopics	15	12
Atrial fibrillation	2	1
Supraventricular tachycardia	6	4

TABLE II
TEMPORARY TRANSVENOUS PACING

Complications	Patients	Percentage
Infection		
Phleblitis	7	5
Infective endocarditis	1	0.9
Mechanical		
Dislodgement	10	8
Repositioning (High threshold)	22	17
Generator failure	7	5
Perforation	3	2
Death	17	13

TABLE III
TEMPORARY PACING: DISLODGEMENT

Route	Patients	Percentage of pacing
Antecubital vein	7	31
Subclavian vein	3	4
Femoral vein	0	0

There were 17 deaths. The aetiological factors associated with the patients who died are shown in Table IV. The main cause of death was seen in patients with anterior myocardial infarction with advanced heart block. Out of the 17 patients who died, ten had cardiac failure, nine had cardiogenic shock and eight had ventricular fibrillation.

DISCUSSION

Although temporary endocardial pacing can be accomplished by several venous routes, a rational

TABLE IV
TEMPORARY PACING: DEATH (17 PATIENTS)

Aetiology	Patients
Complete Heart Block	13
Anterior MI	(5)
Anterior & Inferior MI	(3)
Inferior MI	(5)
Mobitz type II	2
Bifasicular block	1
Giant cell myocarditis	1

decision about the optimal route requires thorough understanding of the complications and results associated with each. Our experience with antecubital vein cutdown shows a higher incidence of infection and dislodgement of the pacing catheter. This is also reported by other investigations.[14-17] Despite routine immobilisation of the involved upper extremity to prevent dislodgement of the tip of the pacemaker catheter, the antecubital route is associated with an increased rate of complications. As such, the antecubital approach is less desirable than the subclavian or femoral vein puncture.

Percutaneous subclavian venipuncture is frequently used in insertion of temporary pacemakers. This procedure is relatively safe and simple, and it has not been associated with significant complications. No patient developed pneumothorax in our experience. However, subclavian puncture should be avoided in patients with severe emphysematous lung or a bleeding diathesis.

Femoral vein puncture for insertion of a temporary pacemaker has been used less often at our institution than in other reported series.[16,17] Some investigators have shown a higher incidence of deep vein thrombosis and even pulmonary embolism with femoral vein temporary pacing.[18,19]

In summary, we have critically compared the complications associated with the various routes of catheter insertion.

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