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Perioperative anticoagulation for children with prosthetic mechanical valves

P Rees[*] and V Grech[**]

[*]*Consultant Paediatric Cardiologist, Cardiothoracic Unit, Great Ormond Street Hospital for Children NHS Trust, London WC1N 3JH, United Kingdom*

[**]*Senior Registrar, Paediatric Department, St. Luke's Hospital, Malta*

Contact information: Dr. Victor Grech, Paediatric Department, St. Luke's Hospital, Guardamangia - Malta ; Email: victor.e.grech@magnet.mt

Abstract

The insertion of a mechanical heart valve predisposes to thrombosis and embolism, and for this reason, individuals with mechanical valves who undergo dental/surgical procedures must take special precautions. In this article, we illustrate a protocol for anticoagulation during such procedures in individuals with mechanical valves.

MeSH: Heart defects, congenital, Warfarin, Heparin, Anticoagulation, Embolism

Individuals with mechanical heart valves are anticoagulated in the long term with warfarin in order to reduce the risk of thromboembolism.[1] It has been calculated that the rate of major thromboembolism without anticoagulation is 8%, and that this risk is reduced by 75% with anticoagulation.[2]

The anticoagulated state is at risk of haemorrhage during dental or surgical procedures, but reduction or discontinuation of warfarin leads to increased risk of thrombo-embolic events. A similar scenario also exists in patients who have suffered recent venous thromboembolism and those with atrial fibrillation.

For this reason, intravenous heparin in used for the prevention of thromboembolism in the perioperative period when the International Normalisd Ratio (INR) is deliberately reduced, in order to shorten the period at risk to the greatest possible extent.

In this table, we demonstrate the current protocol used at the Hospital for Sick Children (London) and St. Luke's Hospital (Malta) for the management of children on long-term warfarin who need dental or surgical procedures.

Day -2	Stop warfarin
Day -1	Loading dose of heparin of 100u/kg bolus then infuse heparin at 25u/kg/hr
Day 0	1. Check INR - can usually proceed with dental procedure/other surgery if INR<2 2. Stop heparin 4 hours preoperatively 3. Restart heparin once tooth socket dry/active bleeding stops by giving another loading dose of heparin and then continue maintenance, both as above 4. Give the usual maintenance dose of warfarin as soon as patient can drink
Day 1	Continue heparin infusion and warfarin usual maintenance dose
Day 2	Check INR. If desired level reached, stop heparin, otherwise continue both heparin infusion and maintenance dose of warfarin and recheck INR day 3 etc

References

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2. Cannegieter SC, Rosendaal FR, Briet E. Thromboembolic and bleeding complications in patients with mechanical heart valve prostheses. Circulation. 1994;89:635–641. [PubMed: 8313552]