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„Analiza wieloczynnikowa ryzyka powikłań zabiegów przezżylnego usuwania elektrod endokwitarnych kardiologicznych urządzeń wszczepialnych”

ABSTRACT

Introduction: Transvenous lead extraction (TLE) procedures for cardiac implantable electronic devices are highly specialized interventions that constitute an essential complement to implantation procedures. Despite their favorable efficacy and safety profile, these procedures are associated with a risk of complications. These include, among others, upper extremity deep vein thrombosis (UEDVT) and lead breakage (LB). The factors associated with the occurrence of these complications have not been fully elucidated. Identification of risk factors for these complications may contribute to improving the safety of these procedures.

Materials and Methods: The analysis included 504 (UEDVT) and 702 (LB) consecutive patients who underwent TLE procedures between 2016 and 2025. Initially, univariate analysis of available parameters was performed. Multivariate logistic regression was subsequently used to identify independent risk and protective factors and to develop predictive models for the studied complications.

Results: Factors independently associated with a lower risk of thrombosis included: TLE performed for infectious indications, the use of dilators during lead extraction, and higher platelet count. Independent risk factors for UEDVT were: a history of malignancy, heart failure in NYHA class IV, longer lead dwell time, and removal of an atrial lead. In patients who developed thrombosis, postoperative pocket hematoma following initiation of anticoagulation therapy was observed more frequently.

Multivariate logistic regression analysis identified independent factors influencing the occurrence of lead breakage during TLE. A protective effect was observed for older patient age at the time of the procedure, prior cardiac surgery, later year of device implantation, and concomitant removal of an atrial lead. A trend toward significance was also noted for the use of a locking stylet. Increased risk of lead breakage was associated with extraction of VDD

leads, the presence of abandoned leads, and prolonged procedure duration. Lead breakage was associated with a higher incidence of pericardial effusion requiring intervention and acute kidney injury.

Conclusions: UEDVT is a serious complication due to the need for anticoagulation therapy, which may lead to the development of a postoperative pocket hematoma.
Lead breakage during extraction carries a risk of life-threatening pericardial effusion requiring urgent intervention.
Careful patient selection and appropriate choice of extraction technique in high-risk patients may significantly reduce the incidence of complications.