

COMPUTER MODEL TO PREDICT IF A VASOEPIDIDYMOSTOMY WILL BE REQUIRED FOR VASECTOMY REVERSAL

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ABSTRACT

Introduction and Objective: Some urologists who perform vasectomy reversals are not experienced in performing a vasoepididymostomy (VE). Our goal was to develop a model that could predict, preoperatively, the need for a VE. Urologists could use this program to identify those patients that may require referral to an experienced VE surgeon.

Methods: Retrospective review of 483 patients who underwent vasectomy reversal by a single surgeon (AJT) over the last 20 years: 393 vasovasostomies and 90 vasoepididymostomies. Selection was based on availability of a chart with sufficient data for analysis. The surgeon utilized established criteria in deciding the type of reversal (e.g. gross appearance of fluid, absence of sperm, or only few sperm heads in vas). Type of reversal, patient age and time since vasectomy were recorded. Univariate analysis revealed that patient age ($p < 0.001$) and time since vasectomy ($p < 0.001$) were significant predictors of reversal type. On multivariate logistic regression analysis, time since vasectomy ($p < 0.001$) was the only significant independent predictor. We designed a decision matrix prediction algorithm based primarily on the time since vasectomy and secondarily on patient age to predict if a VE would be performed. The model was designed using data from 433 patients and then tested on a separate 50 patient group (selected using a random number generator). This separate testing was used to obtain an unbiased assessment of the model's prediction ability. The model was designed to be 100% sensitive in detecting patients requiring VE.

Results: In the test group, the model was 100% sensitive in predicting VE. The model had a specificity, positive predictive value and negative predictive value of 58.8%, 53.3% and 100% respectively. Palm OS™ and Windows™ PC versions of this model were created and may be downloaded as free shareware from: www.esijo.com. The Figure below illustrates a screenshot from the program.

Conclusions: The model provides 100% sensitivity in detecting patients that may require VE during vasectomy reversal (specificity: 58.8%). This model may allow the urologist to preoperatively identify these patients. The model may be accessed by any physician and tested at different institutions for validation and model refinement.

The screenshot shows the 'Vasoepididymostomy/Vasovasostomy Predictor' software interface. At the top, the title 'Vasoepididymostomy/Vasovasostomy Predictor' is displayed in a green box. Below it, the authors' names and the Cleveland Clinic Foundation are listed. The main input area has two fields: 'Patient Age' with a value of 25 and 'Years since vasectomy' with a value of 11. Both fields have a 'Yes' button to the right. Below the input fields, the prediction result is shown: 'Prediction of surgery required: Vasoepididymostomy may not be required'. At the bottom, there are four buttons: 'Help', 'Disclaimer', 'About Program', and 'Exit'. A small disclaimer box is visible in the bottom left corner.

Field	Value	Action
Patient Age	25	Yes
Years since vasectomy	11	Yes

Prediction of surgery required: **Vasoepididymostomy may not be required**

Buttons: Help, Disclaimer, About Program, Exit