

Introduction

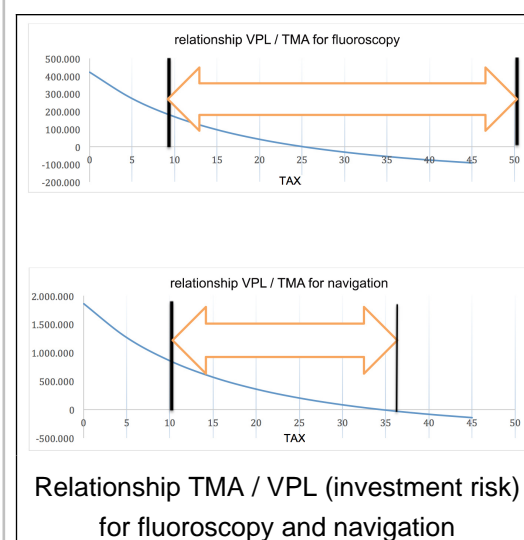
Computer-assisted spine surgery (navigation) has been recommended as a method for spinal pedicle screw fixation, as an alternative to the traditional intraoperative fluoroscopy assisted technique. Due to considerably increased health costs, the acquisition of new equipment required for implementing new technologies, is a major concern, especially in developing countries. Therefore, the adoption of this new technology must be scientifically supported, and both cost and the effectiveness must be thoroughly analyzed, taking regional economic aspects into consideration.

Methods

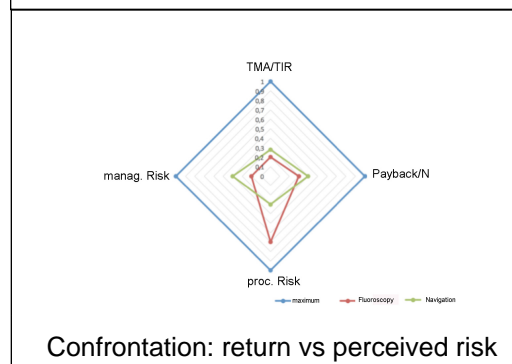
A retrospective cohort study of 40 consecutive patients, who have undergone pedicle screw fixation in the lumbar spine from February 2009 to June 2013, was performed. Average surgical time, hospital stay, correct positioning of screws and exposure to radiation were analyzed together with a financial multi-index methodology, including: net present value, annualized net present value, payback, internal rate of return, net profitability index and return on investment (ROI).

Results

The average surgical time was 4h54min, varying according to number of implanted screws. The average hospital stay time, five days, was directly related to surgery times. Pedicle breach (malpositioning) occurred in 1.4%, all patients remained asymptomatic. Exposure time to ionizing radiation for both patient and surgical team was 7.8 (± 4.9) seconds. It represents 1.7 (± 1.4) seconds per screw, a rate 96% smaller than what has been described for the fluoroscopy technique. The technique (fluoroscopy and navigation) shows good financial profitability, however, navigation affords higher gains on capital invested, with quite significant Net Present Value (NPV) and Annualized Net Present Value (ANPV). The payback for a navigation system is possible, in Brazil, around the fourth year.



Criteria	Low	L / M	Moderate	M / H	High
feedback ROIA					
TMA/TIR index					
Payback/N index					
Procedure risk					
Business risk					
Scale	0-0.2	0.2-0.4	0.4-0.6	0.6-0.8	0.8-1



Conclusions

Navigation reduces the risk of pedicle screw implantation procedures and provides better clinical results and financial gains when compared to fluoroscopy.

Learning Objectives

By the conclusion of this session, participants should be able to: 1) understand the clinical repercussion of the use of navigation tools for spinal screw implantation; 2) discuss the feasibility of the technique concerning economics issues in developing countries; 3) discuss investor risk and profitability for such technological implementation.

References

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