Assessing the Economic Impact of the Adoption of Digital Single-Use Cholangioscopes for the Treatment of Choledocholithiasis During Laparoscopic Cholecystectomy:
A Health Economic Model for Spanish Hospitals

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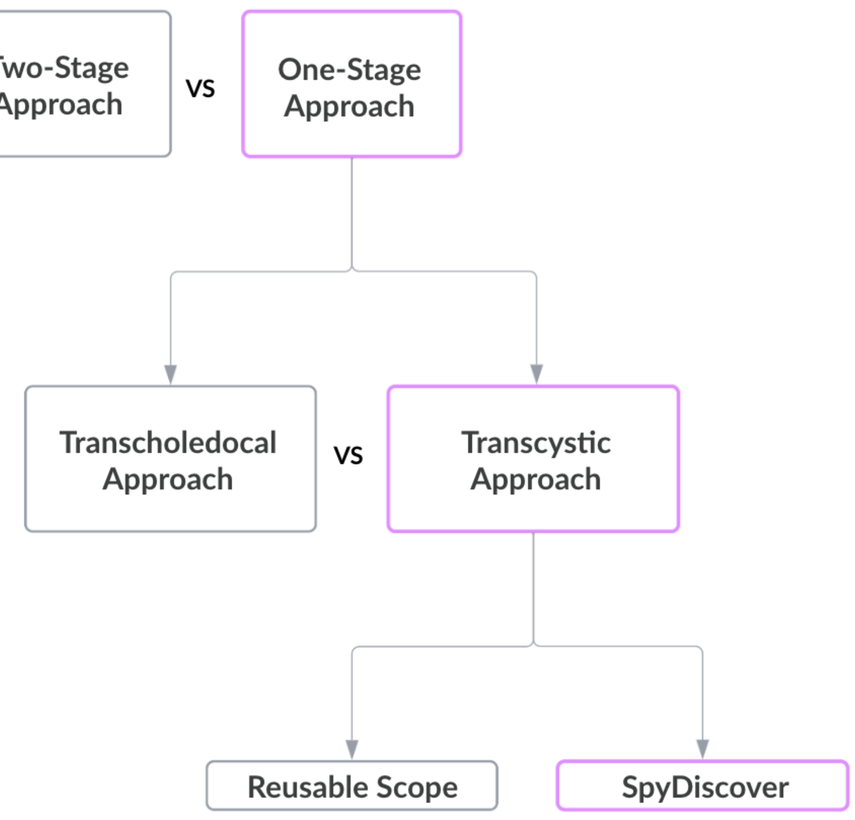
OBJECTIVES

Digital cholangioscope SpyDiscover™ has emerged as an innovative therapeutical alternative for the treatment of choledocholithiasis during laparoscopic cholecystectomy in a one-stage approach (Laparoscopic Common Bile Duct Exploration, LCBDE) versus standard of care, two-stage approach requiring Endoscopic Retrograde Cholangiopancreatography (ERCP). In that context, the following study aims to estimate the **potential direct medical cost savings** in the Spanish public setting resulting from the adoption of the therapy **compared to the standard two-stage approach**, considering both the transcystic and transcholedochal therapeutic approaches.

METHODS

A static decision tree model was utilized to estimate the budget impact over a one-year time horizon from a payer's perspective. Model inputs were categorized into **device acquisition costs, intervention costs, and complications costs** to compare the **one-stage approach versus the two-stage approach** (*Figure 1*), as well as the **transcystic and transcholedochal approaches**, depending on the technology used (reusable or single-use scope). Parametric uncertainty was assessed using a one-way sensitivity analysis.

Figure 1: **Decision Tree Model – Comparative Analysis of Therapeutic Scenarios**



RESULTS

Introduction of SpyDiscover™ in non-LCBDE adopters settings results in a total **cost savings of 2.756€ per case compared to two-stages approach** (*Figure 2*). Performing the transcystic approach for LCBDE with SpyDiscover™ results in a total **cost savings of 668€ per case compared to the reusable scope** (*Figure 3*). Capital costs and Hospital cost were the most influential parameters of the model. The +/- 20% variation in model input parameters still yielded cost saving results (*Figure 4*).

Figure 2: **Total cost per case by treatment arm in Scenario A**

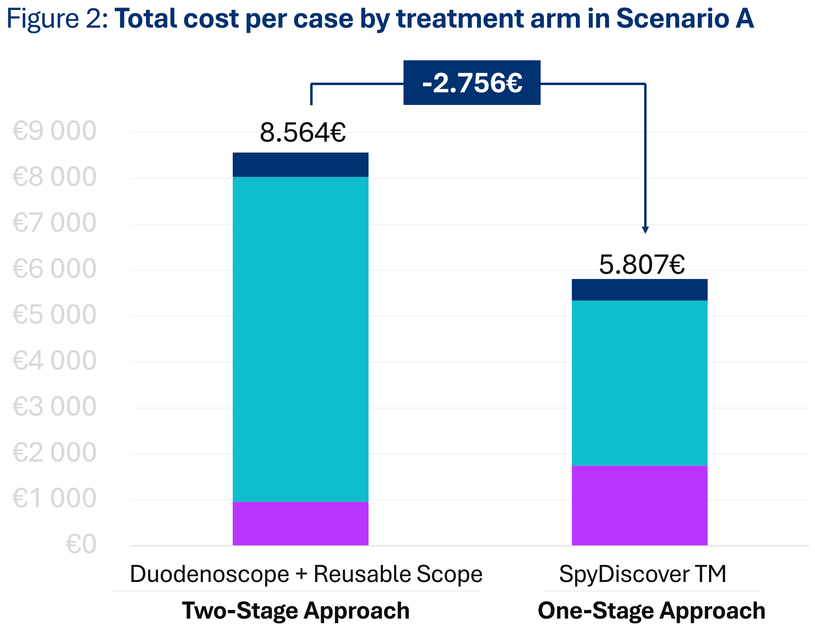


Figure 3: **Total cost per case by treatment arm in Scenario B**

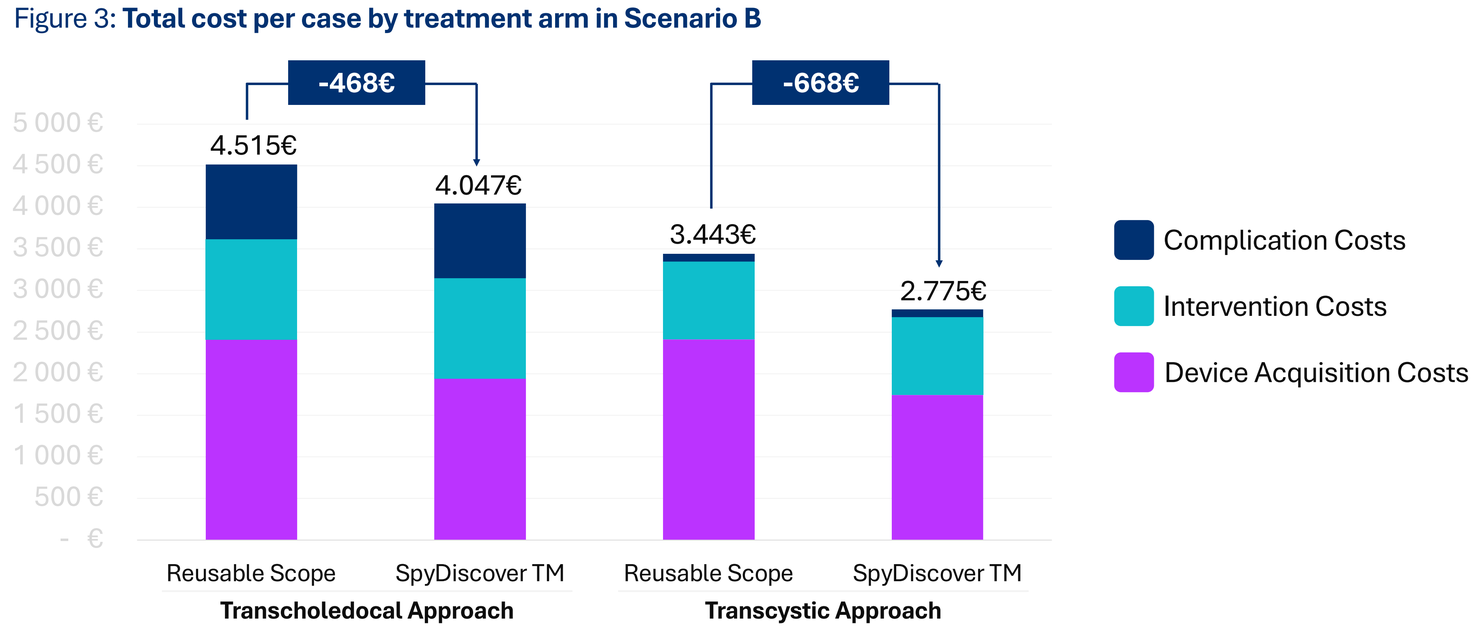
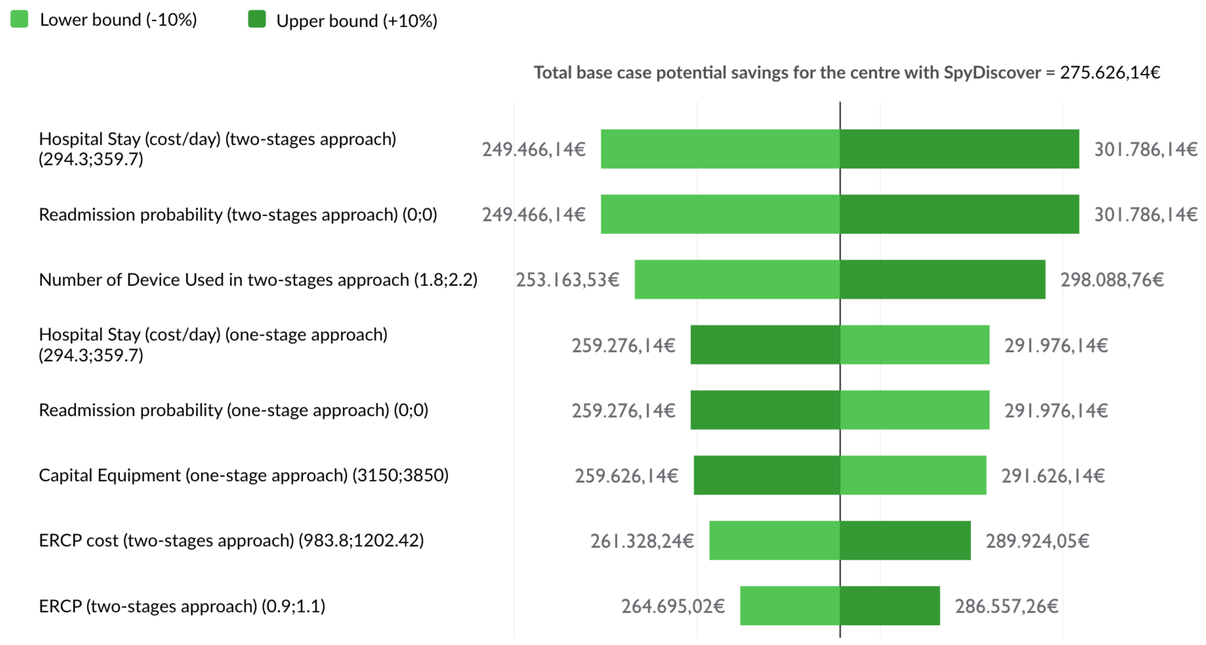


Figure 4: **One-way sensitivity analysis**



CONCLUSIONS

- The adoption of the digital cholangioscope SpyDiscover™ for choledocholithiasis treatment during laparoscopic cholecystectomy in a one-stage approach emerges as a compelling **cost-saving measure** versus current standard techniques, notably in the preferred transcystic clinical approach.
- Its significant reduction in complications (8 upon statistical analysis) further solidifies its clinical value.

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