ROBOTIC-ASSISTED GASTRECTOMY COMPARED WITH OPEN RESECTION: A COMPARATIVE STUDY OF CLINICAL OUTCOMES AND COST-EFECTIVENESS ANALYSIS

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OBJECTIVES

- In the last decade there are clearly important changes in the surgical approach of gastric cancer treatment due to an increased interest in the minimally invasive surgery.
- The objective of the study was to compare the main operative and clinical outcomes and to assess the incremental cost-efectiveness ratios (ICERs) of the two techniques.

METHODS

- Design: This is a clinical and cost-effectiveness analysis within a prospective comparative study of Robotic Gastrectomy (RG) and Open Gastrectomy (OG) conducted at HM Sanchinarro University Hospital from 2015 to 2019.
- Costs (€) from payers perspective, QALYs and incremental-cost-effectiveness-ratios (ICER) were calculated.
- ICER was estimated using overall costs of the RG and OG procedures and QALYs derived from patient interviews, in order to find the incremental cost per QALYs gained.
- QALYs were used to measure effectiveness. QALYs were estimated for 1 year following the procedure for each patient using the medical outcomes study SF-36 questionnaire.
- The cost-effectiveness plane was used to represent all pairs of solutions of the model.
- A cost-effectiveness acceptability curve was computed, which plots the probability that the RG was cost-effective relative to OG.
- A sensitivity analysis was carried out in order to propagate the uncertainty of the estimations to the results of the model.
- We use a multivariate and stochastic sensitivity analysis performed by 5000 Monte Carlo simulations.
- A willingness-to-pay of 20,000€ and 30,000€ per QALY was used as a threshold to recognize which treatment was most cost-effective.

RESULTS

Table 1: Patients Baseline Characteristics

	Robotic (n=25)	Open (n=25)	p-value
Age (years)[a]	65±12,5	67,78±6,8	0,21
Sex: M/F (%)	55,3/44,8	76,5/20,4	0,25
BMI (Kg/m^2)	21,8±2,3	22±2,5	
ASA			0,012
1	5(25)	4(20)	
2	13(65)	13(65)	
3	2(10)	3(15)	
Tumor location			
Upper	10(50)	10(50)	
Middle	6(30)	5(25)	
Lower	4(20)	5(25)	
cTNM stage			
Tis			
T0*	2(10)		
I	3(15)	5(25)	
II	6(30)	7(35)	
III	7(35)	8(40)	
IV	2(10)	0	
Perioperative CT: *n* (%)	15(75)	14(70)	0,33
SUV[b] preoperatory	2,29(0-6,48)	4,35(2-8,9)	0,42

Figure 1: Cost-Effectiveness plane

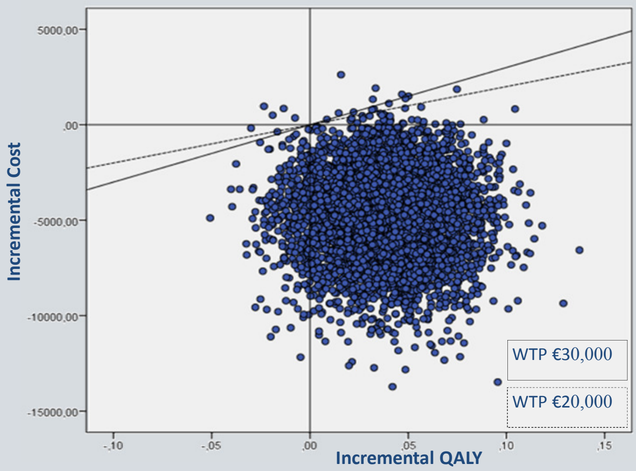

Table 2: Financial Data Stratified by Approach

	Robotic (n=25)		Open (n=25)		p-value
	Mean (€)	CI 95% (Lower;Upper) (€)	Mean	CI 95% (Lower;Upper) (€)	
Hospitalization Cost	5,753.02	4,439.75; 7,066.27	10,554.36	4,785.81; 16,322.91	0.569
Operative Cost	8,471.99	7,711.54; 9,232.43	7,300.95	6,879.17; 7,722.74	0.008
Laboratory Cost	1,343.65	734.23; 1,953.08	2,281.45	1,102.34; 3,460.56	0.224
Radiology Cost	238.46	152.85; 324.07	383.61	257.17; 510.05	0.061
TOTAL COST	**15,807.13**	**13,343.84; 18,270.42**	**20,520.38**	**13,362.99; 27,677.78**	**0.771**
Utility					
Qaly	**0,744**	**0.678; 0.809**	**0.706**	**0.610; 0.801**	
Incremental Results					
Incremental Cost (€)	-4713.25 (CI 95% -4651.18; -4775.31)				
Incremental Utility (Qaly)	0.038 (CI 95% 0.0373; 0.0386)				
ICER (€/Qaly)	**Dominated**				

CONCLUSIONS

- The cost-utility analysis showed that RG resulted in a small increase in QALY compared with OG, and the estimated ICER for patients was dominated by the robotic approach.
- Probabilistic sensitivity analysis estimated by Monte Carlo simulations demonstrated that the probability that the robotic approach was cost-effective was 94.04% and 94.20%, respectively, at a WTP threshold of 20,000€ and 30,000€ per QALY gained.
- RG is safe, technically feasible and oncologically safe when compared to open resections.

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