



POSTOPERATIVE LARYNX US IS MORE COST-EFFECTIVE THAN ROUTINE LARYNGOSCOPY AFTER THYROIDECTOMY TO DETECT VOCAL CORD PARALYSIS. A COMPARISON OF TWO HEALTH SYSTEMS



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Introduction

Postoperative laryngoscopy has been recommended by some groups as a standard of care to define vocal cord paralysis after thyroidectomy. Recently, larynx ultrasound has been assessed as a tool to diagnose vocal cord paralysis and it has been suggested that it can replace routine postoperative laryngoscopy. However, its cost-effectiveness has not been tested. As results of economic evaluations cannot be extrapolated between health systems, it is necessary to assess and compare them between different economic settings.

Objectives

To assess cost-effectiveness of larynx ultrasound as the first test to evaluate vocal cord function after thyroidectomy in comparison to routine laryngoscopy and compare results between USA and Colombia health systems.

Materials and methods

This is a cost-effectiveness analysis. We compared routine postoperative laryngoscopy after thyroidectomy with the larynx US. The decision tree is shown in Figure 1. Data about probabilities were extracted from relevant studies that evaluates operative characteristics of larynx US.

Name	Description	Parameters/Info
vocal_paralysiss_incidence	Incidence of vocal paralysis	Beta, n = 100, r = 8
sen_US	Sensitivity of US	Beta, n = 100, r = 86
sp_US	Specificity of US	Beta, n = 100, r = 99
Laryngoscopy US	Laryngoscopy cost US Dollars	Gamma, alpha = 329,71, lambda = 1,05
Ultrasound US	Ultrasound cost US Dollars	Gamma, alpha = 145,5, lambda = 1,33
Laryngoscopy	Laryngoscopy cost Col pesos	Gamma, alpha = 20,2 lambda = 0,45
Ultrasound	US cost Col pesos	Gamma, alpha = 25 lambda = 1,66
pos_us	Possibility of observing the vocal cords	Beta, n = 100, r = 78
Uspos	Positive result of US	Beta, n = 100, r = 8

Table 1. Model values

The costs were obtained from online sources of average prizes of diagnostic laryngoscopy and neck ultrasound. Effectiveness was evaluated with the number of patients correctly classified with vocal cord paralysis. For each variable of probability and costs, a distribution (beta and gamma, respectively) was assembled. Table 1.

A probabilistic analysis using Monte Carlo simulation with 1000 iterations was done. The unit of measure was US dollars in September 2019 (1 dollar= \$ 3500 col peso).

Results

Figure 1 shows the decision tree assuming the introduction of larynx US at the beginning of the strategy. Probability of postoperative temporal vocal paralysis was 8%; impossibility to identify vocal cords by US was 22%; sensitivity and specificity of US was 86% and 99%, respectively. The costs of laryngoscopy and US in the USA were \$345 and \$193; while the same tools in Colombia costed \$45 and \$15. After simulation, results showed that US strategy is more cost-effective and absolutely dominant than routine laryngoscopy in both economic scenarios. Figure 2

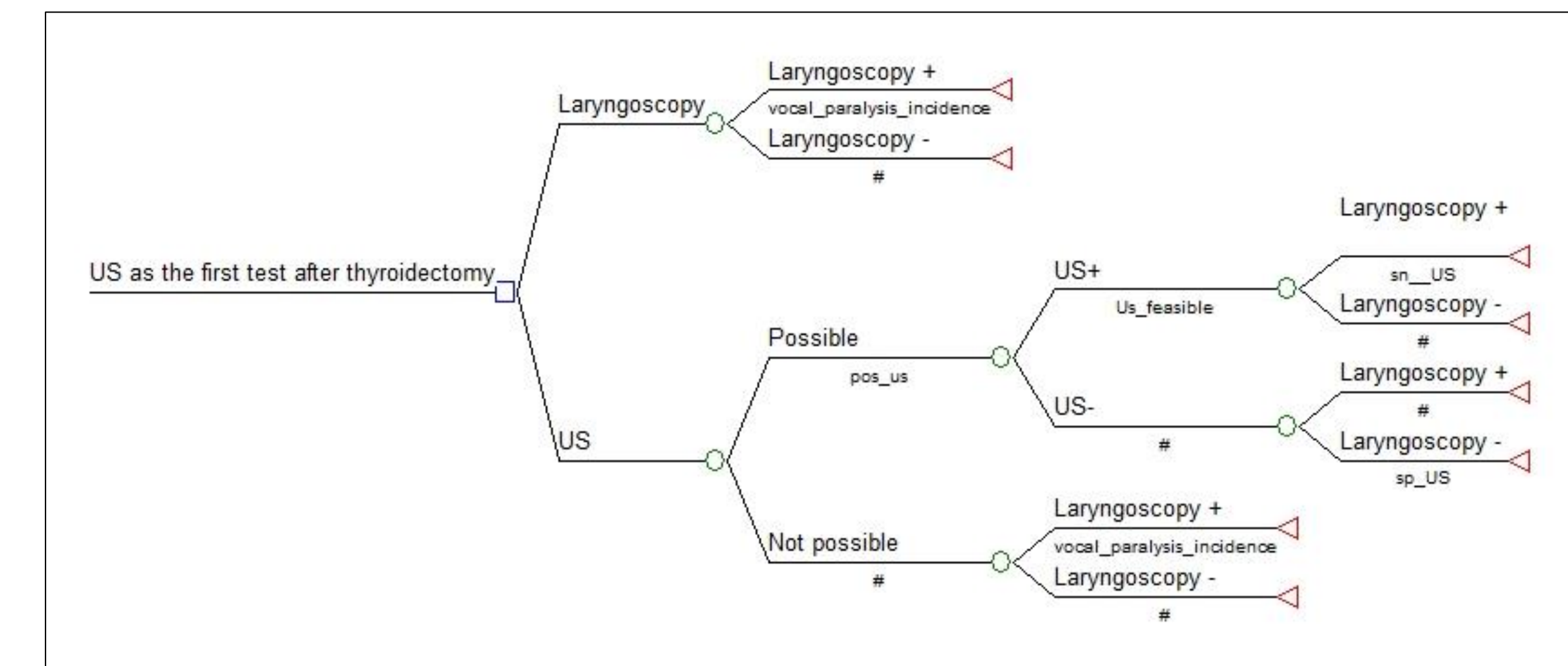


Figure 1. Decision tree

Conclusion

The routine use larynx US after thyroidectomy to detect vocal cord paralysis is more cost-effective than laryngoscopy. There are no differences between two countries with different health systems

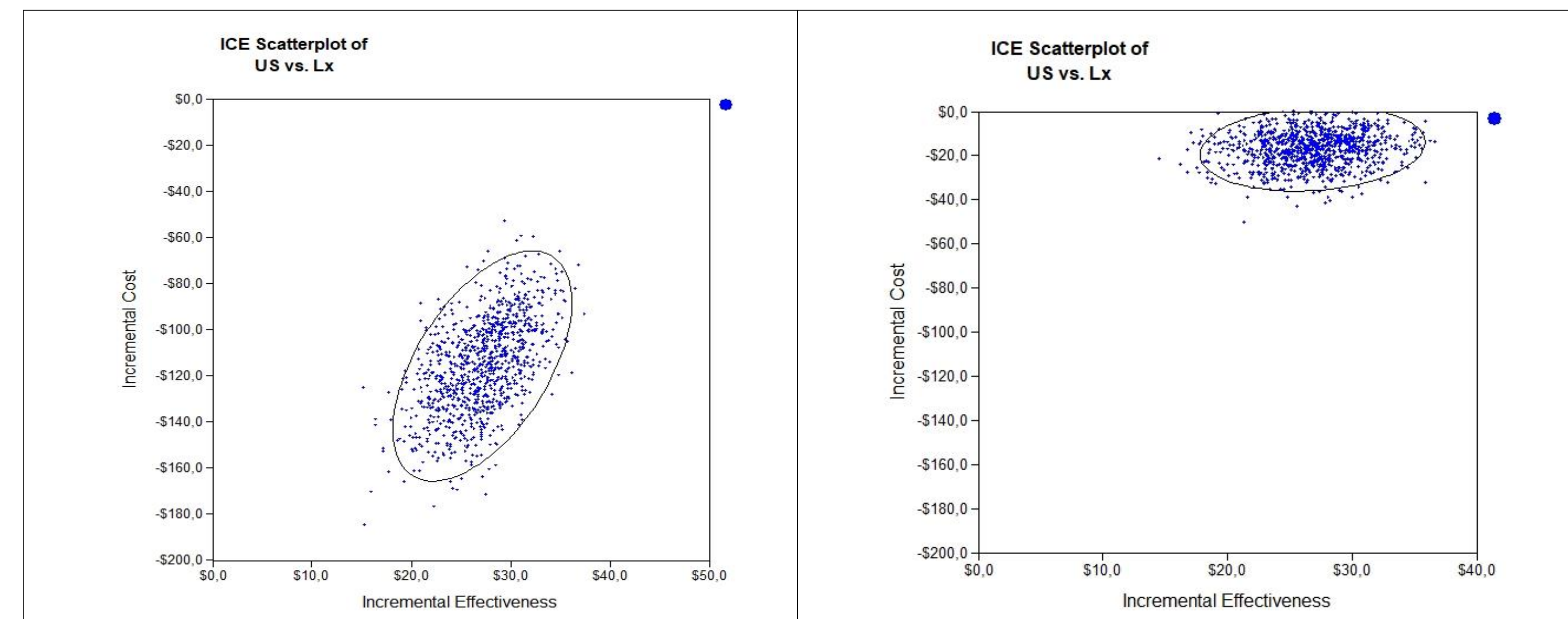


Figure 2. Cost-effectiveness scatterplot (USA left, Colombia, right)