

ECONOMIC IMPACT OF SURGICAL SEALANT USE VERSUS STANDARD OF CARE IN PATIENTS UNDERGOING AORTIC REPAIR AND RECONSTRUCTION: A BRAZILIAN COST-CONSEQUENCE ANALYSIS

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BACKGROUND

Aortic repair and reconstruction are regular procedures and are usually indicated to treat thoracic and aortic aneurysm, aneurysm, dissections and occlusions¹. Intra and postoperative bleeding at the anastomotic suture line are one of the main complications related to this type of surgeries². Major complications due to bleeding are a real challenge for perioperative hemostasis. Failures regarding bleeding management may lead to negative and costly post-operative consequences¹. Preventing complications and events related to perioperative bleeding seem to be a key tenet to improve clinical performance and management of economic resources. COSEAL™ sealant (CSS) is a polyethylene glycol sealant, commonly used in major cardiac and vascular surgical procedures in the prevention of anastomotic bleeding.

OBJECTIVES

To perform a Cost-Consequence analysis based on the estimated cost savings when COSEAL™ sealant (CSS) is used to seal anastomotic closures during aortic reconstruction and repair procedures versus Standard of Care (SoC).

METHODS

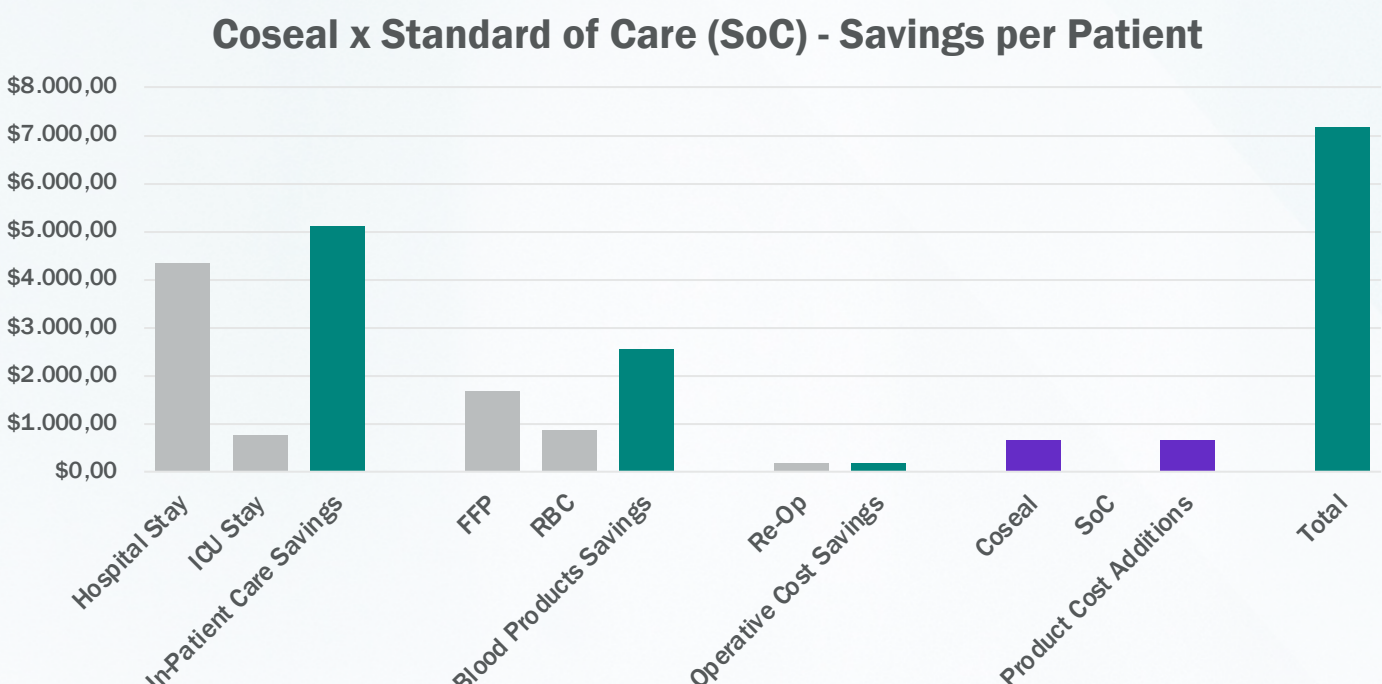
Design and Methodology: This cost-consequence analysis evaluates the use of healthcare resources in patients receiving sutures (SoC) vs. SoC plus CSS in aortic surgeries.

Data Source: Clinical data, such as ICU stay, length of hospitalization, rethoracotomy, use of red blood cells (RBC) and fresh frozen plasma (FFP) has been obtained from Natour 2012¹. Costs have been obtained from Brazilian literature³⁻⁵ and real world⁶; local official sources and economic data from previous years (2016-2017) had been adjusted for annual inflation. (Currency exchange rate/Dec 31st 2019: USD 1.00 = BRL 4.01)

Model Structure: Model results include savings per patient and total budget impact if CSS would be regularly used in patients undergoing aortic surgeries.

Complication and Outcomes (C/O) ¹ and Their Costs			
C/O	Costs	CCS+SOC	SoC
Hospital LOS (Days)	\$885.85 ³	16.1	21.0
ICU LOS (Days)	\$363.52 ⁵	4.3	6.4
Incidence of Rethoracotomy	\$1,189.27 ⁴	2.1%	11.1%
Use of RBC (Un.)	\$623.44 ⁶	3.6	5.0
Use of FFP (Un.)	\$1,870.32 ⁶	2.1	3.0
CSS (Un.)	\$661.00 ⁷	-	-

Table 1: Summary of Clinical Model Inputs and Costs



Graphic 1: Cost-Consequence Analysis and Savings per Patient

RESULTS

Rate of complications, use of blood products and reinterventions were significantly different between the groups (Table 1). The analysis suggest that despite the acquisition cost of CSS+SoC, this is a potentially cost-saving decision representing \$7,162.00 of overall savings per patient (Graphic 1): \$5,099.00 in In-patient care (Hospital and ICU LOS), \$2,555.00 in blood products (RBC and FFP) and \$169.00 in operative costs (Rethoracotomy).

CONCLUSION

Surgical complications and use of resources are main drivers to increased costs. Despite the acquisition cost of CSS, CSS + SoC is a cost-saving decision that impacts the institutional budget in a positive way. Savings could be explained by lower incidence of complications, especially avoided surgical reintervention for bleeding repairing, use of blood products and hospital length of stay.

ACKNOWLEDGMENTS

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REFERENCES

1 – Natour E, et al - Assessment of the effect on blood loss and transfusion requirements when adding a polyethylene glycol sealant to the anastomotic closure of aortic procedures: A case-control analysis of 102 patients undergoing Bentall procedures. J Cardiothorac Surg. 2012 Oct 8;7:105. doi: 10.1186/1749-8090-7-105. 2 – Society of Thoracic Surgeons (STS): Adult Cardiac Surgery Database. Duke. Clinical Research Institute; 2008. <http://www.sts.org/sts-national-database/database-managers/adult-cardiac-surgery-database>. 3 – UNIDAS 2017 + Inflation rate 2017-2019; 4 - Elaboração Valor referencial Procedimento: CIRURGIA TORÁCICA. 4ª ed. 2016 Salvador: SAEB/CGPS, 2016 + Inflation Rate 2016-2019; 5 – PLANISA 2016 + Inflation Rate 2016-2019; 6 – Real World Data; 7 – Maximum Price - Baxter Brazil 2019