Inequity in access to breast reconstruction techniques in Belgian health care system : is it justified ?

MT14

Marbaix S[1,2] ,Feijen M[3], Peperstraete A[4], Hamdi M[5]

[1] University of Mons, Belgium, [2] SNB management, Belgium, [3] Zuyderland Medisch Centrum, Netherlands, [4] AZ Klina, Belgium, [5] UZ Brussel, Belgium

BACKGROUND

Belgium reports the highest incidence rate of breast cancer among the EU countries[1]. Access to the most performant technology should be guaranteed to all breast cancer patients. After mastectomy, the patient can undergo autologous or alloplastic breast reconstruction. In contrast to other European countries, the Belgian health care system allocates distinct budget according to the chosen technique : the autologous breast reconstruction is rewarded based on the updated surgery skills and annual inflation while the budget allocated to innovative breast implants remains at the level of the 10 years old implants. This system jeopardizes access to new generation of breast implants, particularly in patients whose alloplastic breast reconstruction is the only option after mastectomy.

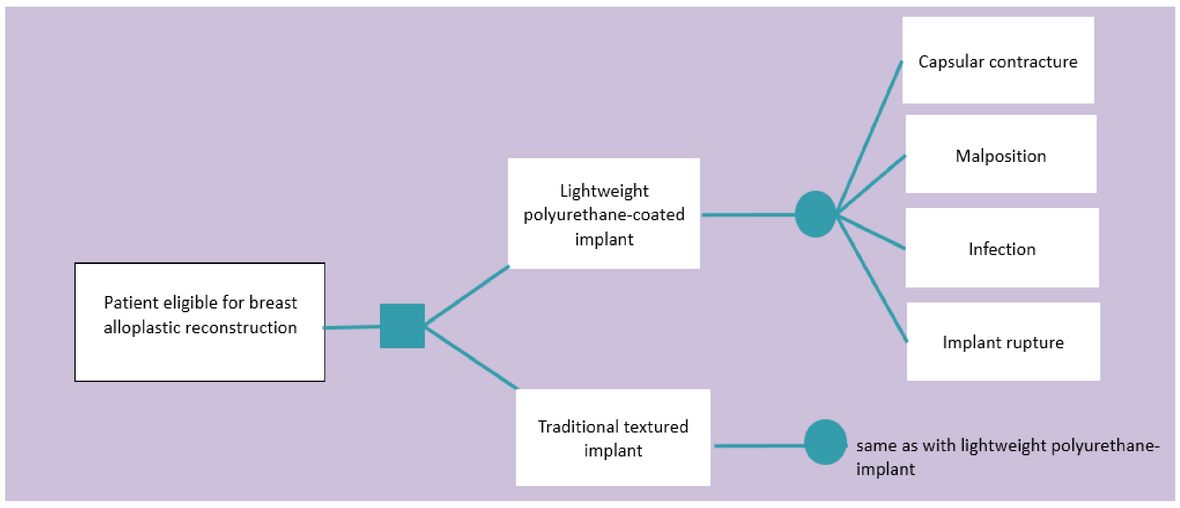
STUDY OBJECTIVE

The present analysis aims to estimate the cost-utility of the anatomical lightweight polyurethane-coated breast implant, compared to the anatomical standard textured implant in patients who are not candidates for autologous reconstruction.

MATERIALS AND METHODOLOGY

The analysis was based on a simple decision tree, modeling technique frequently used in cost-effectiveness analyses of breast reconstruction options[2]. The decision tree is presented in Figure 1. The patient eligible for alloplastic breast reconstruction has the choice between the most commonly used textured implant (= comparator of the analysis) or the lightweight polyurethane-coated implant (= new intervention). Both implants present respective risks of complications. The common complications with alloplastic breast reconstruction are capsular contracture, malposition, infection and implant rupture. They will usually require patient's re-hospitalization.

Figure 1 : Decision in alloplastic breast reconstruction



A time horizon of 10 years was considered for this analysis, in accordance with the minimal lifespan of breast implant. The annual probabilities to present one of the complications are estimated from a systematic review[3] and additional publications[4-7]. Quality of life (Utility) of patients undergoing breast reconstruction and disutilities due to complications are derived from Yoon et al.[8]. To our knowledge, these inputs represent the best available clinical data. The healthcare costs related to hospitalization for breast reconstruction and potential complications have been estimated from data on the NIHDI (National Institute for Health and Disability Insurance) website as well as from a study conducted by the Sickfunds[9-11]. These costs have been reported for the year 2023, applying health index if necessary[12].

The healthcare costs of a unilateral breast reconstruction (including the costs of the implant and of one-day clinic) are estimated at €1,757 with the lightweight polyurethane-coated implant and at €1,402 with the most commonly used textured implant. The patient who has undergone breast reconstruction is also at risk of complications. The annual probability of complications with both types of implant and their costs are reported in Table 1.

Table 1 : Inputs related to complications with both types of implant

Complications	Annual probabilities		Healthcare costs
	Lightweight polyurethane implant	Traditional textured implant	Per complication (NIHDI perspective)
Severe Capsular contracture (Backer III/IV)	2.8% (1st 3 years)[3] 0.6% (beyond year 3)[4]	5.6% (1st 3 years)[3] 2.8% (beyond year 3)[2]	€856[8]
Malposition	0.3%[2]	0.4%[2]	€316[9]
Infection	0,0%[2]	0.7%[2]	€3,501[10]
Silicone rupture	0.0%[5]	0.004%[6]	€856[8]

RESULTS

Over a 10-year period, the total healthcare costs (including complications) are estimated at €1,867 with the lightweight polyurethane-coated breast implant and at €1,896 with the most commonly used textured implant.

The weight reduction of the implant is also beneficial for the remaining skin and soft tissues after mastectomy, reducing pain and improving aesthetics.

In regards of its long-term costs and benefits, the lightweight polyurethane implant is expected to be a cost-saving option compared to the most commonly used textured breast implant (Table 2).

Table 2 : Cost-utility results, from NIHDI perspective, over 10 years (year 2023)

Over 10 years	New lightweight polyurethane implant	Most commonly used textured implant
Total costs	€1,867	€1,896
Total QALYs	7.58	7.52
ICER	-	Cost-saving/dominant

A rapid cost comparison has also been made with the unilateral primary autologous breast reconstruction : in 2023, this complex surgical intervention was reimbursed at €3,548 from NIHDI perspective. The patient is expected to stay for 6 days at hospital[13]. Complication requiring revision has been observed in 1.6% of the patients (at a cost of €963)[10,13]. At this stage, no cost-utility analysis has compared alloplastic and autologous breast reconstruction as target population might be different.

CONCLUSIONS

While the lightweight polyurethane-coated implant is currently fully at charge of the patient, this new technology is estimated to decrease the risk of re-hospitalization due to complications, and impact positively patient's quality of life. This new implant is estimated to be a cost-saving option from NIHDI perspective. Access should be guaranteed to all patients eligible for alloplastic breast reconstruction, in the same way as for the other reconstructive techniques.

REFERENCES

1. https://ecis.jrc.ec.europa.eu/pdf/Breast_cancer_factsheet-Oct_2020.pdf

2.Bouhadana, Gabriel MD; Safran, Tyler; Al-Halabi, Becher; Davison, Peter G. Use of Decision Analysis and Economic Evaluation in Breast Reconstruction: A Systematic Review Plastic and Reconstructive Surgery - Global Open: April 2020 - Volume 8 - Issue 4 - p e2786 doi: 10.1097/GOX.0000000000002786.

3. Duxbury PJ, Harvey JR. Systematic review of the effectiveness of polyurethane-coated compared with textured silicone implants in breast surgery.J Plast Reconstr Aesthet Surg. 2016 Apr;69(4):452-60. doi:10.1016/j.bjps.2016.01.013. Epub 2016 Jan 19. PMID: 26887685.

4.Loreti A, Siri G, De Carli M, Fanelli B, Arelli F, Spallone D, Abate O, La Pinta M, Manna E, Meli EZ, Costarelli L, Andrulli D, Broglia L, Scavina P, Fortunato L. Immediate Breast Reconstruction after mastectomy with polyurethane implants versus textured implants: A retrospective study with focus on capsular contracture. Breast. 2020 Sep 29;54:127-132. doi: 10.1016/j.breast.2020.09.009. Epub ahead of print. PMID: 33010626; PMCID: PMC7529839.

5. Pompei S, Arelli F, Labardi L, Marcasciano F, Evangelidou D, Ferrante G. Polyurethane Implants in 2-Stage Breast Reconstruction: 9-Year Clinical Experience. Aesthet Surg J. 2017 Feb;37(2):171-176. doi: 10.1093/asj/sjw183.Epub 2016 Dec 9. PMID: 27940908.

6. Govrin-Yehudain J, Dvir H, Preise D, Govrin-Yehudain O, Govreen-Segal D. Lightweight breast implants: a novel solution for breast augmentation and reconstruction mammaplasty. Aesthet Surg J. 2015 Nov;35(8):965-71. doi:10.1093/asj/sjv080. Epub 2015 Sep 1. PMID: 26333989; PMCID: PMC4622048.

7. Handel N, Cordray T, Gutierrez J, Jensen JA. A long-term study of outcomes, complications, and patient satisfaction with breast implants. Plast Reconstr Surg. 2006 Mar;117(3):757-67; discussion 768-72. doi: 10.1097/01.prs.0000201457.00772.1d. PMID: 16525261.

8. Yoon AY, Bozzuto L, Seto AJ, Fisher CS, Chatterjee A. A Systematic Review of Utility Score Assessments in the Breast Surgery Cost-Analysis Literature. Ann Surg Oncol. 2019 May;26(5):1190-1201. doi: 10.1245/s10434-019-07160-x. Epub 2019 Jan 23. PMID: 30673898.

9. https://www.aim-ima.be/Borstreconstructies?lang=nl, inflated to year 2023

10.https://inami.fgov.be

11. https://tct.fgov.be

12. https:// statbel.fgov.be

13.https://www.ima-aim.be. Ackaert, Katte (2023), Évaluation de la Convention sur la reconstruction mammaire, AIM Agence Intermutualiste, Bruxelles.

ISPOR Congress 12-15 November 2023, Copenhagen