Feasibility of Systematic Breast-Conserving Surgery Under Local Anesthesia and Sedation: A Large Single-Center Study

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Abstract

Local anesthesia with sedation (LAS) for breast cancer surgery is a good option. We conducted a single center study comparing outcomes of general anesthesia and LAS for conservative surgery. With more than 700 LAS surgeries, we showed the feasibility and safety of this approach. Decrease of hospitalization length stay thanks to LAS can also be an advantage in terms of health care organization.

Introduction

Local anesthesia with sedation (LAS) is widely used in other surgical disciplines but remains underutilized in breast-conserving surgery (BCS), where general anesthesia (GA) is still the standard [1, 2]. Recent reports have demonstrated the potential of LAS in selected breast surgery cases [3-5]. We aimed to evaluate the feasibility of systematically performing BCS under LAS in a high-volume breast cancer center.

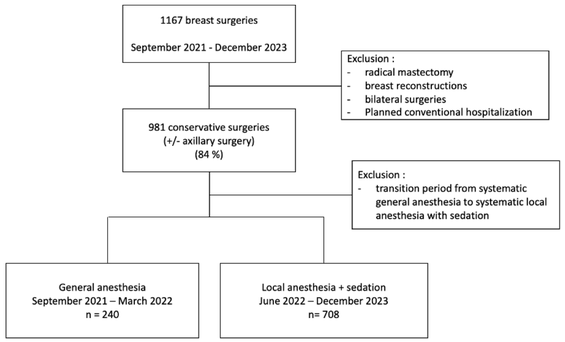


Figure 1. Flow chart

Methods and Materials

We conducted a retrospective study including all patients who underwent BCS ± axillary surgery from September 2021 to December 2023 in our institution. Patients operated under GA during the initial period (Sept 2021-March 2022) were compared to those under LAS (June 2022-Dec 2023), excluding the transition phase.
The technic combined intravenous sedation (midazolam, dexmedetomidine, ketamine, remifentanil) with local infiltration (naropeine, lidocaine with epinephrine, saline).
Feasibility endpoints included conversion to general anesthesia, intraoperative tolerance, and early surgical complications.

Table 1. characteristics of the population depending of the type of anesthesia

	General anesthesia, n=240		Local anesthesia, n=708		p
	Median or n	Range or %	Median or n	Range or %	
Age (years)	58	[18-89]	58	[13-97]	0.166
Axillary surgery					0.06
No	104	43%	339	48%	
Yes	138	58%	369	52%	
Preoperative bracketing wire					**<0.001**
No	99	41%	143	20%	
Yes	141	59%	565	80%	
Operative time (mn)	29	[10-94]	27	[10-65]	0.11
Duration in the operative room (mn)	50	[19-115]	46	[15-99]	**<0.001**
Duration in recovery room (mn)	53	[11-159]	10	[5-195]	**<0.001**
Total duration of hospitalization (hh:mn)	06:53	[3:00-12:22]	05:53	[2:00-12:12]	**<0.001**
Type of cancer*					0.343
In situ	50	26%	99	21%	
Lobular invasive	20	10%	56	12%	
Ductal invasive	124	64%	324	68%	
Reoperation*					
No	163	84%	402	84%	1
Yes	31	16%	77	16%	

** only for cancer cases*

Results

Of the 948 BCS procedures performed during the study period, 708 (75%) were carried out under LAS. Among the eligible patients during the LAS period, 12 refused local anesthesia and were operated under general anesthesia. Only 2 conversions to GA occurred during LAS procedures (0.3%), confirming excellent feasibility.
We planned more preoperative wire in the LAS group (80% vs. 59%) because of the aqueous environment making small lesions more difficult to feel.
Re-operation rates (for positive margins, hematoma, or infection) did not differ between LAS and GA groups (11% in LAS group vs. 13% in GA group, p=0.34).
Axillary procedures were performed in both groups (52% in LAS group and 58% in GA group, n=0.06). Oncoplastic techniques were successfully performed under LAS without compromising safety or outcomes.

Table 2. factors associated with a total stay in the clinic <390 mm (median of the whole population) - multivariate analysis

	OR	IC95%	p
Type of anesthesia			
General anesthesia	1		
Local anesthesia+sedation	2.86	[1.96-4.23]	**<0.001**
Preoperative bracketing wire			
No	1		
Yes	0.3	[0.21-0.47]	**<0.001**
Type of axillary surgery			
No	1		
Lymph node clearance	1.21	[0.61-2.48]	0.83
Sentinel lymph node dissection	0.72	[0.51-1.05]	0.19

Discussion

We demonstrated the feasibility of this procedure.
We showed reduced hospitalization time.
BCS under LAS for breast cancer under LAS seems to be safe for patients, in terms of clean margins.
Few studies have compared the LAS with the GA.
Protocols for sedation vary, and studies have focused on awake surgery with a paravertebral block or tumescence [6, 7]. Studies have concluded that there is a reduction in the length of stay and a positive economic balance [8, 9].
Moreover, local anesthesia appears to affect positively breast cancer prognosis, even if the results are discordant [10,11].

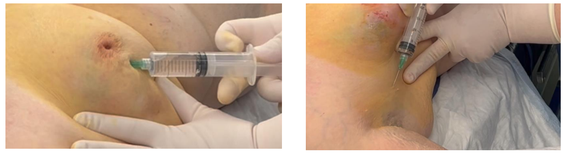


Figure 2. local anesthesia injection in breast and axillary area

Conclusions

Our results confirm that systematic BCS under LAS is feasible, safe, and applicable to a wide range of breast surgical procedures, including oncoplastic and axillary surgeries. To our knowledge, this represents the largest reported single-center series of breast-conserving surgery performed under LAS, supporting its broader implementation in routine clinical practice and perioperative optimization strategies.

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