

# Pain in Ambulatory Surgery: 4 Year Experience of an Ambulatory Surgery Unit in a Tertiary Hospital

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## Abstract

There has been a recent trend toward performing joint replacement in the outpatient setting. The objective of this study was to retrospectively evaluate and report on our initial 29 patients that underwent outpatient total shoulder arthroplasty (TSA). There were no re-admissions or emergency room visits for any patients during the 90-day post-operative period. 86% of patients said their pain was very well controlled post-op

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and 14% said their pain was moderately controlled. 89.6% of patients said they would prefer to go home the same day if they were to undergo TSA again. 96.5% of patients were satisfied with their TSA and outcome at a minimum of 6 months post-op. This initial report corroborates with previous studies that show outpatient TSA is safe. We also showed a high degree of patient satisfaction.

## Introduction

At present, the number and complexity of surgical procedures performed in ambulatory setting are increasing. Ambulatory surgery now accounts for up to 70% of all elective surgical procedures in some countries (1). Moreover ambulatory surgery has gained wide patient acceptance and its cost effectiveness is already proven (2). For these reasons the postoperative pain after ambulatory surgery is getting more and more attention (3,4).

Postoperative pain therapy in ambulatory setting is even more challenging, as it requires effective analgesic techniques with minimal secondary side, which has to be managed at patient's home by themselves. The method of choice is widely variable between Ambulatory Surgery Units (ASU). The majority of ASU use multimodal analgesic approach combining, acetaminophen, dipyrene, nonsteroidal anti-inflammatory drugs, weak opioids, and local or regional anesthesia (5).

Contrary to the common belief that postoperative pain in ambulatory setting is a rare symptom, evidence shows that pain after ambulatory surgery has a high incidence (6).

To provide adequate pain treatment to our population, more information is needed regarding postoperative pain in our ASU. Accordingly, the specific goals are determine the incidence of pain in the first 48 hours in our ASU, and the anesthesia technique and surgical specialties that seems to be associated with postoperative pain.

## Methods

We analyzed, retrospectively, the clinical data of patient submitted to surgery in our ASU of the Ocidental Lisbon Hospital Center from 1st January 2012 to 31st December 2015.

After appointment with their surgeon, all patients had a consultation with an anesthesiologist who assesses clinical and social conditions for performing the procedure in an ambulatory setting. Then they met the nurse team to the pre-operative counseling. 48 hours before the surgery, a telephone call was made by the nurses to confirm the maintenance of the clinical and social conditions and

reinforce the pre-operative teaching. On the day of surgery, one of the anesthesiologist's responsibilities was to evaluate the discharge conditions for home and to instruct the postoperative procedures and analgesia. Patients were discharged from the post anaesthesia care unit to the ASU when their Aldrete scores are 9 or more. The analgesic regimens were in accordance with the recommendations for the treatment of acute postoperative pain in ambulatory surgery, of the Portuguese Ambulatory Surgery Association (5).

All patients who answered the nurse telephone postoperative questionnaire at 24h and 48h were included. Data were registered in a computer database (Access®). Patient demographic information the American Society of Anesthesiology physical status (ASA) and the referral given to situations in which the pain did not alleviate with the prescribed therapy were registered. The number of surgeries performed by surgical specialties and their anesthetic technique were also assessed.

The main outcomes were the presence of postoperative pain at 24h or 48h and the prevalence of pain that does not relieve with prescribed analgesia (uncontrolled pain).

The descriptive statistical analysis was done using SPSS software® (version 24 IBM corporation), by an investigator without intervention in the surgical procedure or anesthesia. Categorical variables are expressed in absolute number and percentage, and continuous variables are expressed as mean  $\pm$  standard deviation. Chi-Square test was used to compare categorical variables and a p value of less than 0.05 was considered statistically significant.

## Results

We collected data from 6304 patients that were managed in our ASU. The gender distribution was 3530 (56%) female and 2774 (44%) male. The mean age of the patients was 42 years (SD + - 22,0). The distribution according to the ASA was as follows: ASA I - 1650 (26,2%), ASA II - 3823 (60,6%), ASA III - 805 (12,8%), ASA IV - 26 (0,4%).

Plastic surgery was the specialty with the highest number of surgeries performed (n=1366) followed by Ear Nose & Throat and Urology

(Table 1). According to the anesthesia technique, general anesthesia has been the most chosen (n= 4423). Regional anesthesia techniques represent more than 15% of all cases with a preponderance of spinal block technique (n= 506) (Table 1).

The follow-up questionnaire was answered by 6008 patients (response ratio of 95.3 %) of which 29.1% (n=1750) reported postoperative pain. Nevertheless the majority of these patients (93%) reported pain relieved with the prescribed therapy.

Uncontrolled pain was reported by 130 patients, which represent 2.2% of all patients (130/6008). The patients who were submitted to Neurosurgery and Orthopedic procedures were those who more frequently mentioned pain that was not relieved with prescribed analgesia: 3.9% (24/618) and 3.7% (24/646), respectively (Table 2). Among anesthesia techniques, regional anesthesia was the one with highest rates uncontrolled pain 3.4% (35/1020). Peripheral block was the technique who perform worse, 3.8% (13/317) (Table 2).

The majority of patients who reported uncontrolled pain required adjustments in the analgesic regimen (50%, N=65), whereas in approximately a quarter of the patients, hospital referral was deemed necessary (21.5% N=28) and in another quarter, enhancement of the clinical advice (23.9%, N=31) (Table 3).

## Discussion

Although this study is based in one centre only, some results are similar with other centres and countries (2,4,6,7). The results are based on a telephone questionnaire-survey, with a response ratio of 95.3 % which is slightly higher than other studies (2–4).

Another Portuguese study, fulfilled also in a Tertiary Care Hospital (7) had more General Surgery, Vascular Surgery and Orthopedics' procedures in opposition of Plastic Surgery, ENT and Urology surgery performed in our ASU. However anesthetic techniques were very similar, General Anesthesia 70.6% vs. 70.2%, sedation 18.3% vs. 11.8% and Loco-regional anesthesia 11.2% vs. 16.2%.

**Table 1** Patients' distribution according to Surgical Specialties and Anesthesia technique.

Specialties	N (%)	Anaesthesia Technique	N (%)
Plastic Surgery	1366 (21.7%)	General Anesthesia	4423 (70.2%)
Ear Nose & Throat	861 (13.6%)	Regional Anesthesia	1020 (16.2%)
Urology	840 (13.3%)	Spinal Block	506 (8.0%)
Gynaecology	789 (12.5%)	Peripheral Block	317 (5.0%)
Orthopedics	646 (10.2%)	Local	195 (3.1%)
Neurosurgery	618 (9.8%)	Endovenous Block	2 (0.0%)
General Surgery	604 (9.6%)	Sedation	747 (11.8%)
Stomatology	335 (5.3%)	Combined Anesthesia	56 (0.9%)
Vascular Surgery	222 (3.5%)	No register	58 (0.9%)
Gastroenterology	16 (0.0%)	<b>TOTAL</b>	<b>6304 (100%)</b>
Pneumology	7 (0.0%)		
<b>TOTAL</b>	<b>6304 (100%)</b>		

**Table 2** Uncontrolled pain according to Surgical Specialties and Anesthesia technique.

Specialties	N	(%)	P_value	Anaesthesia Technique	N	(%)	P_value
Neurosurgery	24	3.9%		General Anaesthesia	79	1.8%	
Orthopaedic	24	3.7%		Regional Anaesthesia	35	3.4%	
General Surgery	16	2.7%		Peripheral Block	13	3.8%	
Plastic Surgery	24	1.8%		Spinal Block	18	3.4%	
Stomatology	6	1.8%	<0.001	Local	4	2.1%	0.004
Ear Nose & Throat	14	1.6%		Sedation	12	2.5%	
Urology	12	1.4%		Combined Anaesthesia	1	1.8%	
Gynaecology	9	1.1%		No register	3	5.2%	
Vascular Surgery	1	0.5%					
<b>Total</b>	<b>130</b>			<b>Total</b>	<b>130</b>		

**Table 3** Patients' referral who reported pain unrelieved with prescribed analgesia.

	N	%
Enhance the clinical advice	31	23.9%
Adjustments in the analgesic regimen	65	50.0%
Hospital referral	28	21.5%
No register	6	4.6%

On the other hand, Gramke and colleagues report more general surgery (30%) and orthopedics (26%), procedures with general anesthesia being the technique chosen in 62% of the cases and the loco-regional 38%. (4)

In the first 48 postoperative hours, 29.1% of our patients reported pain, which is similar to McGrath and colleagues (2) but clearly lower than the data presented in other studies, that reports nearly 60% (8,9).

Although our questionnaire did not quantify the pain, for comparison purposes, we assumed that pain that is not controlled with analgesic prescription could be considered severe. The incidence of pain that does not relieve with analgesic prescription (2.2%) is also lower when compared with other studies, that report incidence of severe pain between 5.3% (9) and 20% (8).

These differences in pain incidence may be due not only to the different pain assessment methodologies (yes/no answer in our study vs. assessment scales in other studies) but also to the evolution in pain knowledge and treatment in last years, using combinations of medications with different mechanisms of action in the context of multimodal analgesia, and to the fact that in our ASU there were fewer surgical procedures associated with severe pain (e.g. General surgery, Orthopedic surgery).

As our postoperative questionnaire does not reflect the patients who did not adhere to the analgesia, our results can even be overestimated.

As in our ASU, McGrath and colleagues found that Neurosurgery, General Surgery and Orthopedic Surgery had higher incidence in severe pain (2). Also Gramke and colleagues found that operations of nose and pharynx, abdominal operations, plastic surgery of the breasts, and orthopedic operations of the extremities were the most painful procedures during the first 48 hours (4).

Local and regional anesthesia seems to increase uncontrolled postoperative pain, in our study population. Matilla and colleagues found that general anesthesia supplemented with local anesthesia increase the risk of postoperative pain in either adults or children. (6) Probably the clinical staff overestimates the analgesic effectiveness of local and regional technique and underestimates the importance of counseling on the therapeutic compliance or misjudges the analgesic requirements at home.

Our hospital referral rate due to pain, 0.46% (28/6008), is similar to other hospitals that report rates of 0.26% (2) to 1.5% (6). The

low hospital referral rate is low, probably because there is 24 hour telephone support, where anesthesiologists are available to advise and adjust analgesic medication.

Fear for side effects of analgesic medication seems to be a relevant factor affecting patient compliance for postoperative analgesics (4), as Apfelbaum and colleagues revealed that 94% of patients thought that some analgesics prescribed after surgery caused adverse effects (10). Thus, clarifying the patients is cornerstone for optimal pain management after ambulatory surgery.

Selection of analgesic schemes may vary between institutions and countries. However, many of the observations related to pain, namely the surgical specialties, anesthesia techniques, and incidence of pain are consistent with results obtained in outpatient populations in Canada and Netherlands (2,4), suggesting that our results are also relevant to other institutions.

This study allowed us to better understand one of the most important and challenging indicators of morbidity in outpatient surgery: the postoperative pain. We have identified the specialties and anesthetic techniques in which uncontrolled pain is more frequent, which will allow an optimization of the analgesic regimens. Further investigation and development of surgery-specific protocols for management of pain at home will probably improve the quality of recovery after ambulatory surgery.

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