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Research Article

Development and Challenges of Ambulatory Surgery in Centre West of Tunisia: A Study of Hand, Reconstructive and Aesthetic Surgery Practices

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Abstract

In Tunisia, ambulatory surgery remains underdeveloped due to the lack of clear legislative texts, dedicated structures, trained personnel and the sociocultural characteristics of the population. Its application in areas such as reconstructive and aesthetic surgery raises concerns about quality and safety, which led to the conduct of this study.

In our study involving 250 patients, ambulatory surgery accounted for 15.5% of hospitalizations and 17.6% of surgical procedures. The average age of the patients was 41.7 years, with an Aesthetic Surgery Practices (ASA) score predominantly of 1 or 2. The interventions mainly concerned hand and reconstructive surgery.

Patients under 40 years old were more often operated on under general anesthesia and for aesthetic procedures, while patients over 40 years old underwent more hand surgeries under locoregional anesthesia. Women had more hand surgeries under locoregional anesthesia, while men underwent reconstructive procedures under local anesthesia.

Patients with medical histories were more at risk of postoperative complications. During follow-up, all cases showed simple postoperative outcomes without mortality, though 8 patients developed late algodystrophies, all managed effectively.

Keywords: Ambulatory Surgery; Reconstructive Surgery; Hand Surgery; Surgical Safety; Postoperative Complications

Introduction

Ambulatory surgery, a concept developed in 1909 by James H. Nicoll and published by Farquharson in 1955, saw significant growth in the 1980s, particularly in the United States, Canada and the United Kingdom [1,2]. It is defined by the International Association of Ambulatory Surgery (IAAS) as surgery performed without overnight hospitalization and by the French High Authority for Health (HAS) since 2012 as surgery performed in an operating room with discharge on the same day [3]. In 2013, ambulatory surgery represented 83% of procedures in the United States, 79% in England and 70% in Scandinavian countries, but only 43% in France due to an ill-defined legislative framework until the end of the 20th century [4,5]. In Tunisia, despite some attempts, its development is limited by the lack of clear legislative texts, appropriate infrastructure and specialized training [6].

Initially reserved for simple procedures like cataract or hernia surgery, ambulatory surgery now includes more complex interventions such as cholecystectomy, nephrectomy and certain gynaecological surgeries [7-11]. However, its application in more complex fields, such as hand, reconstructive or aesthetic surgeries, raises questions about the quality and safety of care

[7,12-14]. This study aims to evaluate the prevalence of ambulatory surgery in our department, its compatibility with reconstructive plastic and hand surgery and its benefits compared to conventional surgery.

Patients and Methodology

This is a cross-sectional and retrospective observational study conducted in the Plastic Reconstructive and Aesthetic Surgery Department of Habib Bourguiba Hospital in Sfax, involving patients who underwent ambulatory surgery between July 2015 and August 2018. Only patients who stayed less than 24 hours at the hospital and could be followed up were included, while those who stayed overnight, were transferred to another department or were treated for burns were excluded. The data collected (demographic, preoperative, operative and postoperative) were extracted from clinical records, operative reports and anesthesia sheets. The parameters analysed included residence, ASA score, type of anesthesia, nature of the surgery (hand, reconstructive, aesthetic), operative costs and postoperative outcomes. Data were analysed using SPSS 20 software with various statistical tests (Shapiro-Wilk, Student's t-test, chi-square, Fisher's exact test, Pearson or Spearman correlation). The significance threshold was set at $p < 0.05$. A diagram detailing the typical patient care pathway was presented to illustrate the six main stages of their follow-up (Fig. 1, S Table 1,2).

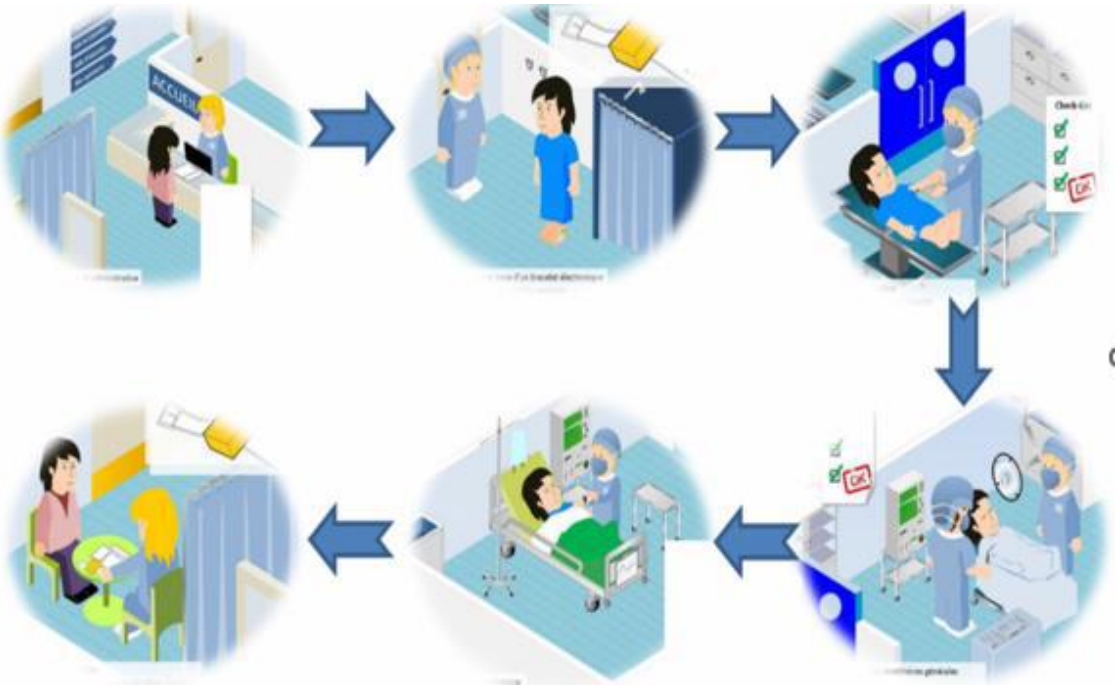

Figure 1: The main stages of ambulatory surgery. Step one: patient reception; Step two: patient preparation and dressing; Step three: anesthesia; Step four: intervention; Step five: post operative care; Step six: verification of patient aptitude to go home.

Results

In this study, 250 patients who underwent ambulatory surgery between July 2015 and August 2018 were included, representing 15.5% of admissions and 17.6% of surgical procedures in our department. The average age of the patients was 41.7 years, with a sex ratio of 0.748 (M/F). 75.2% of patients were from urban areas and 139 had medical histories, mostly high blood pressure and diabetes. The surgeries performed were mainly hand surgery (42.8%), reconstructive surgery (50%) and aesthetic surgery (7.6%). All patients consulted with an anaesthesiologist before the operation and 90% were operated on under local or locoregional anesthesia. The mean operative time was 32.5 minutes under General Anesthesia (GA), 14.43 minutes under Locoregional Anesthesia (LRA) and 17.92 minutes under Local Anesthesia (LA). Patients were discharged after an average of 7 hours and 34 minutes. The immediate postoperative follow-up showed no complications; however, 13 late complications were noted at eight weeks, with algo dystrophy being the most frequent. Seven patients required reoperation for additional procedures. A significant correlation was found between the type of anesthesia and age ($p=0.005$), with a trend toward local anesthesia for younger patients (<40 years) and locoregional anesthesia for older patients (>40 years). A positive correlation between sex and anesthesia type was also observed, with men more often receiving local anesthesia ($p=0.003$), while women received more locoregional anesthesia ($p=0.001$). Patients with medical histories were more likely to develop postoperative complications ($p=0.028$). Finally, patients

undergoing hand surgery under locoregional anesthesia had more frequent algodystrophies (p=0.016), while no cases were observed under local anesthesia.

Discussion

Ambulatory surgery is growing globally but remains marginal in certain regions. In our department in Sfax, 17.6% of CPRE surgeries were performed ambulatory, a figure reflecting cultural and structural differences. Patient eligibility for this type of surgery depends on various criteria: age, medical history and clinical status. Age is not an exclusive selection factor, although premature infants and some children are often excluded [15]. Older adults tend to benefit more from ambulatory surgery due to the increased risks associated with hospitalization [16].

Sex constitutes an additional influencing factor, with a higher proportion of women undergoing ambulatory surgery, primarily attributed to the higher prevalence of specific pathologies in the female population [17,18]. Regarding habitat, the distance from home to the healthcare facility is a determining factor, although exceptions exist, as in Canada, where longer distances are accepted [19,20]. Comorbidities such as diabetes and high blood pressure are assessed at admission. Well-controlled diabetes and high blood pressure do not contraindicate ambulatory surgery [21].

Cardiac and respiratory histories, if well-managed, also allow patients to be eligible. However, severe disorders require specialized care [22,23]. Psychiatric disorders, often seen in older patients, can be managed with appropriate care [24]. The majority of patients in our study were ASA 1 or ASA 2, which aligns with standard eligibility criteria for ambulatory surgery [25]. The most common procedures were hand surgeries, including carpal tunnel release and soft tissue tumor excision [26]. Local or locoregional anesthesia was most commonly used with general anesthesia being more frequent, among children.

The costs associated with ambulatory surgery are lower than those of conventional hospitalizations, reducing expenses and optimizing the use of infrastructure. This model also has advantages for patient comfort and their quick return to work [27,28]. Control of postoperative pain and appropriate use of antibiotic prophylaxis are crucial for satisfactory outcomes [26,29].

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Ambulatory surgery is very safe, with severe complications and deaths being extremely rare [19,27]. Minor complications such as per operative cardiovascular issues, severe postoperative pain and nausea/vomiting are more frequent [28,30]. According to several large series, complications in ambulatory surgery remain low: 106 complications out of 13,433 patients and morbidity of 1/1366 out of 38,598 patients [8,30]. In our series, no major complications were reported, with some cases of nausea/vomiting resolved by symptomatic treatment. No deaths were recorded in the eight weeks following surgery.

Patients with medical histories are more likely to develop postoperative complications (p=0.028), a factor often not discussed in the literature. A significant relationship was observed between locoregional anesthesia and algo dystrophy (p=0.016), although algo dystrophy is multifactorial. Medical history and hand surgery characteristics are risk factors for this complication [31-33]. Based on our findings, recommendations to promote ambulatory reconstructive and aesthetic surgery include the creation of legislative texts to define the legal framework, eligibility/exclusion criteria and relationships between stakeholders (surgeons, anesthesiologists, nurses, administrative staff) [34,35]. These texts would also help establish reimbursement criteria for insurance funds. It is recommended to set up dedicated ambulatory surgery units with specialized staff and defined care protocols [36].

Rigorous patient selection is essential to reduce complication rates, along with preoperative anesthesia consultation to manage medical histories such as diabetes and high blood pressure. Preoperative patient education would also ensure adequate postoperative follow-up.

Conclusion

Local and locoregional anesthesia should be prioritized to ensure a short length of stay and continuous monitoring during the procedure should be maintained to monitor vital functions. Finally, routine prescriptions for non-narcotic analgesics and antiemetics, when necessary, are recommended, as well as quick resumption of chronic medications to avoid decompensation of chronic disease. It is important to limit hospitalization time, particularly for elderly patients, to preserve their routine and avoid disorientation. Postoperative follow-up with a visit within the week following the procedure would also be essential. This model would help promote ambulatory surgery while improving safety and care efficiency.

Conflict of Interest
The authors declare that there is no conflict of interest.

Free and Informed Consent Term
The patient authorized the publication of the article.

Availability of Data and Materials
Data is custodied by the author and can be released on trust.

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Appendix

Characteristic	Value
Total number of patients	250
Average age	41.7 years (SD = 16.69)
Minimum / Maximum age	2 / 85 years
Sex (M/F ratio)	0.748
Residence (Urban/Rural)	75.2% urban
ASA score (1/2/3)	96.8% ASA 1 or ASA 2
Number of patients with medical history	139 (high blood pressure), diabetes, etc.)
Types of surgery:	
- Hand surgery	107 (42.8%)
- Reconstructive surgery	125 (50%)
- Aesthetic surgery	19 (7.6%)
Types of anesthesia:	
- General anesthesia (GA)	25 (10%)
- Locoregional anesthesia (LRA)	150 (60%)
- Local anesthesia (LA)	75 (30%)
Average duration of interventions under:	
- General anesthesia (GA)	32.5 minutes
- Locoregional anesthesia (LRA)	14.43 minutes
- Local anesthesia (LA)	17.92 minutes
Average length of hospitalization	7 hours 34 minutes
Immediate postoperative complications	0 (0%)
Late postoperative complications (8 weeks)	13 (5.2%)
- Algodystrophy	8 (3.2%)
- Other complications	5 (2%)
Number of patients reoperated	7

S Table 1: Descriptive results.

Variable	Statistical Test	Result / p-value
Age and type of anesthesia	Student's t-test / ANOVA	p = 0.005 (significant)
- General anesthesia for young (<40 years)		
- Locoregional anesthesia for >40 years		
Sex and type of anesthesia	Fisher's exact test	p = 0.003 (significant)
- Local anesthesia more frequent in men		
- Locoregional anesthesia more frequent in women		p = 0.001 (significant)
Medical history and postoperative complications	Fisher's exact test / Chi-square	p = 0.028 (significant)
Hand surgery and algodystrophy	Chi-square / Correlation	p = 0.016 (significant)
Locoregional anesthesia and algodystrophy	Chi-square / Correlation	p = 0.016 (significant)
Duration of intervention and type of anesthesia	Student's t-test	p < 0.05 (significant)
Duration of hospitalization and type of anesthesia	Student's t-test	p < 0.05 (significant)
Medical history and reoperation	Fisher's exact test	p = 0.25 (not significant)
Sex and aesthetic surgery	Fisher's exact test	p = 0.56 (not significant)

S Table 2: Statistical results summary.