

Analysis of the disease constituent ratio and prognosis of patients undergoing ambulatory surgery in oral and maxillofacial medicine: a monocentric retrospective analysis of 427 patients

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Research Article

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Abstract

Background

Ambulatory surgery and single-visit surgery are becoming increasingly accepted and practiced in oral and maxillofacial medicine worldwide due to their social and economic benefits. In China, however, their use is still insufficient and falling behind. To innovatively optimize the surgical procedure, research on the types and frequencies of surgeries is needed. The prognosis of patients also has yet to be studied.

Methods

The clinical data of patients undergoing the same treatments (ambulatory surgery) were collected, and information on their chief complaint and its history, age, and diagnosis characteristics was specifically included. Follow-up phone calls were conducted 1 and 3 days, 1 and 2 weeks, and 1 month after treatment. Information on their recovery and well-being was collected.

Results

A total of 427 patients were recruited for this study, including 224 males and 203 females. Their ages ranged from 1–68 and averaged 23.07 ± 11 . Ambulatory surgery was voluntarily selected by 43.55% of the patients. A total of 62.9% of them selected it for convenience, while 43.55% selected it for pain reduction. The three top diseases treated via ambulatory surgery were impacted teeth (accounting for 56.7% of the total incidence), odontogenic cysts (14.75%), and supernumerary teeth (10.1%). Postoperative complications occurred in 248 of the 427 patients, and the incidence rate was 58.08%. The top three complications were postoperative pain (56.44%), restricted mouth opening (30.91%), and postoperative nausea and vomiting (7.49%). There were no cases of life-threatening complications or death. The complications frequently occurred on Day 3 after the operation and resolved after 2 weeks.

Conclusion

Ambulatory surgery has been increasingly acknowledged as one of the most effective patterns of treatment and service. Accordingly, broader use of it is necessary. Further development of ambulatory surgery (related to oral and maxillofacial surgery) is possible with the assistance of anesthesia and nursing personnel, while it may create multiple challenges for clinical institutions. In current settings, ambulatory surgery can be further developed by optimizing the regulations regarding diagnosis and treatments, promoting the dissemination of medical and clinical knowledge, increasing the engagement of related personnel, and improving the professionalism and timeliness of postoperative follow-ups.

Introduction

Outpatient surgery, including dentoalveolar and cancer removal surgery, is a key procedure in oral and maxillofacial treatments. Conventional outpatient surgery consists of three sequential steps: preliminary diagnosis, outpatient surgery and a follow-up visit. Each step is performed one time. Since multiple visits are needed, patients experience time and cost burdens. Dental fear is another major hurdle in conventional outpatient surgery, particularly for children [1, 2]. Its psychological manifestations include fear, anxiety, worry, increased sensitivity, reduced forbearance and rejection of treatment in certain cases. Common causes of dental fear include perception, treatment and iatrogenic factors. This problem is further aggravated by the frequent use of some tools and instruments. For example, piezosurgery, high-speed turbines, and osteotomes are needed for the extraction of impacted teeth. Therefore, research is needed to address the issue of convenience and comfort in outpatient surgery. In particular, dental fear needs to be addressed and minimized.

The continuous development of ambulatory surgery shows promise for treatment options. According to the International Association for Ambulatory Surgery (IAAS), surgery and diagnosis intervention are completed within one day in this way. Additionally, outpatient surgery can be avoided, and hospitalization is no longer needed upon completion [4]. Another benefit of ambulatory surgery is reduced pain and discomfort, since general anesthesia is routinely applied in the process. In typical practices of single-visit surgery (SVS), nursing is integrated into the one-time appointment so that a presurgical assessment could be performed. Follow-up phone calls are conducted afterward. Compared to conventional surgery that requires multiple visits, one-time ambulatory surgery allows for more comfort and convenience. In particular, it proves effective in cost savings and patient satisfaction in pediatric surgery and other related fields [6–10].

In this work, a retrospective study was conducted on 427 patients treated by ambulatory surgery in the Department of Oral and Maxillofacial Surgery. The current status and potential future development of ambulatory surgery in the department were analyzed to provide guidance for clinical practice and research. We believe it will further help to improve the procedure and performance of related treatments.

Data and methods

Patients treated between 09/2020 and 12/2021 by the same key physician and assistants were recruited for the study. Medical records and data from the follow-up study were analyzed with a retrospective study method. The ethics of the study were approved by the Committee of Ethics of The First Affiliated Hospital of Anhui Medical University.

Treatment procedure

The perception and willingness of the patients were assessed first. When the surgery appointment was made, other relevant inspections were performed simultaneously, including routine blood, hepatorenal function, electrolyte, electrocardiogram, coagulation function, and chest X-ray examinations. A preanesthesia assessment was performed as well, and patients categorized within the I-II level according to the American Society of Anesthesia (ASA) were excluded. Patients with contraindications to surgery were excluded as well. Education was provided to patients 1 day before surgery by phone call, and they were treated with general anesthesia after hospitalization. During surgery, their vital signs, medical advice and operations were recorded. Their health conditions were further assessed upon leaving, and postsurgery concerns were discussed. The length of hospitalization was no longer than 24 hours.

Postsurgical visits

Follow-up phone calls were performed at days 1 and 3, weeks 1 and 2 and one month after hospitalization to obtain information on the health conditions of patients and provide guidance for recovery. Specifically, information on complications, delayed discharge, unplanned resurgery and rehospitalization was collected. Once abnormal symptoms or severe complications were observed, patients were informed of the rediagnosis. Patient comments were collected at the last phone call.

Statistical analysis

Data were input into Excel, inspected by two researchers, sequenced and calculated. The ratio of different diseases was recorded as a percentage (%). Demographic data, for example, the average age, were recorded in the form of the average \pm standard deviation.

Results

Demographic information

A total of 427 patients were included in the study, including 224 males and 203 females. Their ages ranged between 1 and 68 years old and averaged 23.07 \pm 11. Among them, 45 were infants (0–6), 43 were children (7–12), 23 were adolescents (13–17), 302 were adults (18–45), and 14 were elderly individuals (>45). According to their chief complaints, 43.55% of the patients selected ambulatory surgery voluntarily, while the other 56.45% selected it after receiving medical advice. Among the former, time saving (27.40%) and pain reduction (13.11%) were the two major reasons for the decision (Fig. 1).

The diseases treated via ambulatory surgery (serving department of stomatology) consisted mainly of impacted teeth, odontogenic cysts, and supernumerary teeth (Table 1). The incidence of the above diseases showed an age-dependent distribution. Ankyloglossia had the highest incidence among infants and children (0–6 years old, 23 cases), and supernumerary teeth occurred most frequently among children (7–12 years old, 28 cases). Impacted teeth and odontogenic cysts occurred most frequently among adolescents (13–17 years old, 6 cases), while the incidence of impacted teeth peaked in adults (18–45 years old, 230 cases). Among the elderly group (>46 years old), 6 cases involved benign tumors and tumor-like masses, while 4 were impacted teeth (Table 2).

Postsurgical effects and complications

Complications and adverse symptoms occurred in 248 of the 427 patients, and the incidence rate was 58.08%; the complications and adverse symptoms included postsurgical pain (56.44%), limited opening (30.91%), and vomiting (7.49%). There were no deaths or cases of severe complications (Table 3). Three cases of dry socket resolved after medication, while there was 1 case of a reoccurring cyst of the oral mucous gland (recovered after resurgery). The rate of reoccurrence was 0.9% (the total rate of reoccurrence was calculated as follows: cases of reoccurrence/cases of tooth-derived cancer+ benign oral cancer+ tumor-like + cases of cysts of the oral mucous gland+ cases of jaw cysts). Details of the postsurgical complication time distribution are shown in Figure 2.

Discussion

Ambulatory surgery has been developed continuously in developed countries for the last two decades due to the shortened times for waiting and hospitalization, reduced costs and risks of transmission, improved arrangement of medical resources, and enhanced recovery results for patients. It has been applied to more than 80% of all surgeries [11]. However, ambulatory surgery has been insufficiently practiced in China. Within oral and maxillofacial surgery, there are a wide variety of diseases treatable by ambulatory surgery, including extraction of impacted teeth, alveolar surgery, decompression of mandibular odontogenic cysts and so on. Therefore, ambulatory surgery can greatly contribute to oral and maxillofacial surgery. To promote and improve its use, it is necessary to study the disease characteristics of relevant patients.

According to our results, 70.73% of the patients were aged between 18 and 45 years. Since patients in this age range tend to have a greater burden in terms of school or job work, convenience was a major factor in their decision-making and was addressed by ambulatory surgery. Convenience could be a crucial advantage for promoting its further broader use. We believe these patients (18–45 years old) should be categorized into a separate group in oral and maxillofacial ambulatory surgery because their health conditions and body functions are superior to those of the other age groups. Accordingly, they commonly showed better forbearance in surgery, which minimized risk. It is potentially feasible to reduce the duration of hospitalization, times of follow-up phone calls, and overall costs by optimizing the treatment procedure while maintaining the safety of the operation. According to the incidence and timing of occurrence of complications, patients can meet the requirements for discharge during postsurgical visits at 1-hour intervals (4 h after completion of surgery). The health conditions of the patients were tracked by providing medical advice and follow-up visits on days 3 and 7 after surgery.

Different from the adult group (18–45 years old), the selection of surgery types was mainly determined by guardians when younger patients (0–17 years old) were treated. These younger patients are more vulnerable to retarded neuron growth when general anesthesia is applied. As a result, they tended to delay surgery or select partial anesthesia. According to existing studies [12–14], the risk of impaired cognition was low with 1 h of general anesthesia, and it continuously decreased with age. In this study, the main diseases of most 0–6-year-old infants (and children) included ankyloglossia, supernumerary teeth, and mucous gland cysts, which did not require treatments longer than 1 h, and there were no cases with severe postsurgical complications. Therefore, it was safe to perform ambulatory surgery in infants and children. Additionally, the promotion of ambulatory surgery among teenage patients can be achieved by disseminating related concepts and knowledge about ambulatory surgery among the public, for example, information on general anesthesia.

According to our results, complications mostly occurred within the first three days after surgery, and they gradually diminished afterward. To manage and minimize such risks, physicians and nurses should make more detailed records and give medical advice accordingly, including advice on diet, medication, and physical activities. Physicians and nurses should also provide training on reporting abnormal health conditions and reminders on rehospitalization. Follow-up visits can be used to track patient health status, provide individualized guidance, and relieve anxiety after surgery. In addition, it helps to prevent and identify postsurgical complications and improve the overall safety of treatment. Our study reported 3 cases of dry socket, which mostly occurred within 2 days after surgery and had a higher incidence as the difficulty of surgery increased [15, 16]. In addition, extraction of impacted teeth always caused a large area of damage, and it was difficult to differentiate its pain and dry socket by follow-up phone call. To address this problem, it is necessary to inquire whether their pain is relieved with time. If such pain lasted longer than 1 week, a reinspection is necessary for timely treatment. Although cysts of the mucous glands and benign tumors and tumor-like masses involved smaller incisions, these conditions had a high risk of reoccurrence. The time length and frequency of follow-up visits should be increased accordingly so that earlier identification and treatment can be applied in a timely manner.

Among the studied patients, 2 cases reported extraction of internal bone fixation. They recovered well after surgery without any complications or discomfort. Related surgery was relatively easy with minimum risk when imaging techniques were applied for guidance. We believe such methods can be promoted in ambulatory surgery once necessary assessments are performed by the chief physician.

Conclusion

Ambulatory surgery has been developed continuously as an effective clinical method that satisfies the various needs of patients. It can be further developed in oral and maxillofacial surgery as a convenient and effective treatment option. We believe its further development can be achieved by optimization of treatment procedures, dissemination of related knowledge, and improvement of professionalism and timeliness of follow-up studies.

Declarations

Additional Requirements

The development of ambulatory surgery in China is still in its infancy due to the simultaneous involvement of surgery, anesthesia, and perioperative management. Oral and maxillofacial surgery in the form of ambulatory surgery is only initially carried out in some medical institutions, not yet popularized, and lacks a unified and standardized process. This retrospective study discussed the disease distribution, characteristics and prognosis of patients undergoing ambulatory surgery in oral and maxillofacial medicine and accumulated experience for the improvement and innovation of the ambulatory surgery treatment process.

Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Author Contributions

Honghao Wang: Ideas, Development or design of methodology, Original Draft, Funding acquisition Yifan Chi: Application of statistical, Original Draft Jun Hou: Funding acquisition, Review & Editing, formulation or evolution of overarching research goals and aims. Hanxiao Huang: Software, Original Draft Yao Lu: Review & Editing Mingen Yang: produce metadata Tingyu Li: Project administration All authors read and approved the final manuscript.

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Tables

Table 1. Diseases, sex, age composition and average operation time of patients undergoing ambulatory surgery in oral and maxillofacial medicine

Disease type	Number of cases	Male	Female	Average age	Average operation time (min)
Impacted teeth	246 (57.61%)	117	129	26.28±6.77	97.56±35.90
Jaw cyst	63 (14.75%)	33	30	24.67±10.45	29.69±7.83
Supernumerary teeth	43 (10.07%)	30	13	9.65±7.83	49.41±24.37
Ankyloglossia	24 (5.62%)	17	7	3.38±1.56	10.05±1.49
Benign tumor and tumor-like	20 (4.68%)	12	8	37.55±12.87	29.17±7.05
Cyst of mucous gland	16 (3.75%)	6	10	8.00±5.63	18.28±6.73
Odontogenic cyst	7 (1.64%)	5	2	19.71±10.18	38.43±7.04
Submandibular duct calculi	3 (0.70%)	1	2	34.67±44.54	19.33±7.10
Removal of internal fixation devices for fractures	2 (0.47%)	2	0	36.50±6.36	51.50±6.36
Others	3 (0.70%)	1	2	47.33±18.58	34.33±11.50

Table 2. The proportion of diseases in different age groups

Order	0-6 years		7-12 years		13-17 years		18-45 years		Over 46 years	
	Disease type	Incidence rate	Disease type	Incidence rate	Disease type	Incidence rate	Disease type	Incidence rate	Disease type	Incidence rate
1	Ankyloglossia	5.39%	Supernumerary teeth	6.56%	Impacted teeth	1.41%	Impacted teeth	53.86%	Benign tumor and tumor-like	1.41%
2	Supernumerary teeth	1.87%	Jaw cyst	1.18%	Jaw cyst	1.41%	Jaw cyst	10.77%	Impacted teeth	0.94%
3	Cyst of mucous gland	1.87%	Cyst of mucous gland	0.94%	Supernumerary teeth	1.17%	Benign tumor and tumor-like	2.81%	Jaw cyst	0.47%

Table 3. Postoperative discomfort and complications

Symptom	Number of cases	Incidence rate
postoperative pain	241	56.44%
restricted mouth opening	132	30.91%
postoperative nausea and vomiting	32	7.49%
fever	20	4.68%
hemorrhage	3	0.70%
dry socket	3	0.70%

Figures

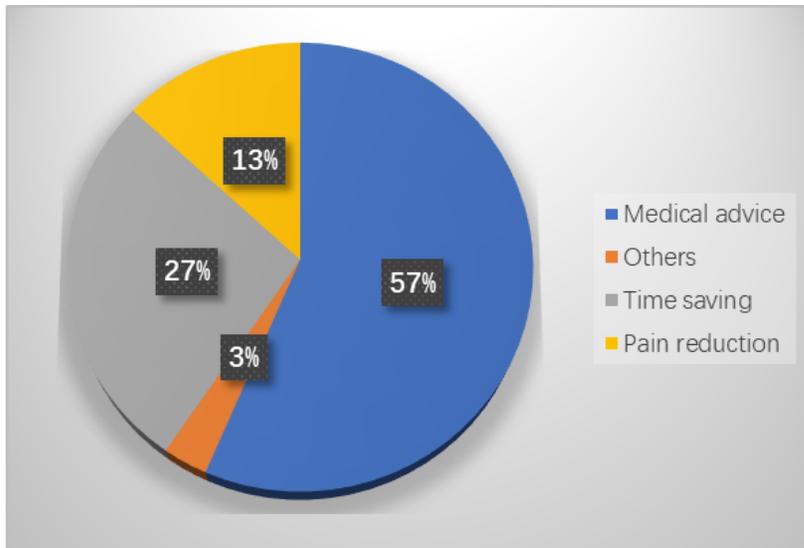


Figure 1

Distribution of reasons for patients choosing ambulatory surgery

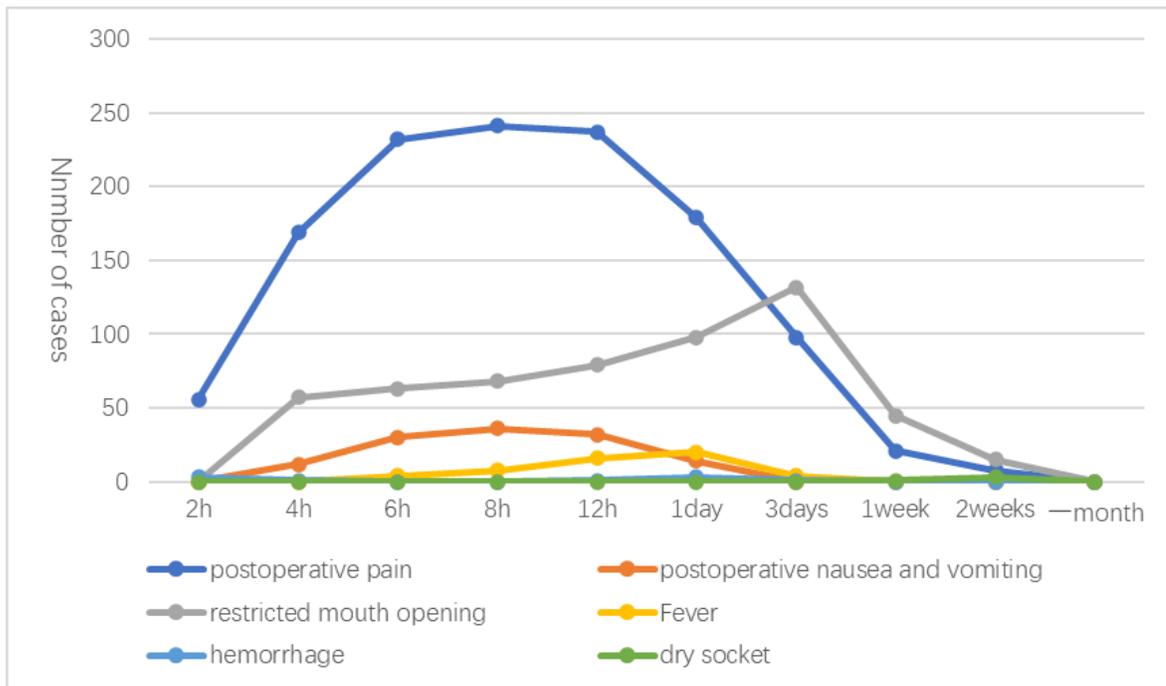


Figure 2

Postsurgical complication distribution over time