



A STUDY OF RISK FACTORS FOR POSTOPERATIVE COMPLICATIONS AFTER ORAL SURGERY

Dental Science

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ABSTRACT

Aims And Objectives: This study was to identify important risk factors for postoperative complications in the patients who underwent oral surgery.

Materials And Methods: This study was an observational study done in the department of Oral Surgery, in a Tertiary hospital in Central India. All patients who underwent mildly to moderately invasive oral surgery admitted under Oral surgery department from January 2020 to December 2020 were included in the study by convenience sampling. A total of 106 patients were thus included in the study. Apart from age, gender and significant co-morbidities like diabetes, heart diseases, risk factors such as serum albumin levels, blood loss volume, operation time were studied.

Results: Out of 106 patients, majority i.e. (64)60% were males and 42(40%) were females. Majority of patients i.e. 42(40%) were in the age group of 45-60 while 32(30%) were above 60 years age. Univariate analysis done showed a statistical relationship between postoperative complications and diabetes ($p < 0.05$), preoperative serum albumin level ($p < 0.05$), and operation duration ($p < 0.05$) and blood loss during surgery ($p < 0.05$).

Conclusion: Diabetes, low serum albumin, blood loss and prolonged operation time are risk factors for post-operative complications in patients after oral surgery.

KEYWORDS

oral surgery, complications.

INTRODUCTION:

The oral surgeries for various conditions like impacted tooth extraction, cyst excision, fixation of mandibular and maxillary fractures, jaw deformity (osteotomy), resection of a benign tumor, sinus lifting, bone grafting, removal of a sialolith etc have increased during the last decade some of which may cause complications affecting the recovery and quality of life of the patients. Oral cavity has a large number of micro-organisms, which can delay normal wound healing or cause infection in a surgical region. Surgical site infection and aspiration pneumonia are common complications causing increased morbidities in the patients following oral surgery (1, 2). In the patients with head and neck cancer, the rate of surgical site infection ranges from 10% to 45%, with previous chemotherapy, performance of a tracheotomy, free flap reconstruction, blood loss volume, and hypoalbuminemia noted as risk factors (3,4,5,6). Thus severely invasive surgery like reconstructive surgery, flap surgery and host nutritional status are predictive risk factors for head and neck cancer patients. A recent study showed that preoperative good oral health care can reduce the risk of surgical site infection, indicating its importance to reduce postoperative complications (7). Apart from oral cancer, very few studies have been done on complications in patients after an oral surgery to determine the risk factors so that complications can be reduced. Hence we have conducted this study to identify important risk factors for postoperative complications in the patients who underwent mild to moderate invasive oral surgery.

METHODOLOGY

The present study was an observational study with a prospective design. It was carried out in the department of Oral Surgery, in a Tertiary hospital in Central India. All patients who underwent mildly to moderately invasive oral surgery admitted under Oral surgery department from January 2020 to December 2020 were included in the study by convenience sampling. A total of 106 patients were thus included in the study.

Inclusion Criteria:

All patients who needed surgery coz of impacted tooth extraction, cyst excision, fixation of mandibular and maxillary fractures, jaw deformity (osteotomy), resection of a benign tumor, sinus lifting, bone grafting, removal of a sialolith, and others.

Exclusion Criteria:

The patients of Oral cancer who underwent primary resection, neck dissection, and reconstructive surgical procedures were excluded from the analysis.

Demographic data like age, sex was obtained. Clinical data included

presence of any co-morbid condition like diabetes, heart disease and respiratory disease. Blood loss volume, operation time was noted during the operation. None of the patients needed a blood transfusion. Antibiotics were administered in all cases for 3-7 days after the operation. Blood serum albumin level was examined on the day before surgery. Hypoalbuminemia was defined as a serum albumin below 4.0 mg/dl. We also looked for the occurrence of complications such as anastomotic leak and surgical site infection within 14 days after surgery. SPSS version 20 was used for statistical analysis. Fisher's exact test, a Mann-Whitney U test was used and p value less than 0.05 was considered statistically significant.

RESULTS:

A total of 106 patients were studied out of which a majority i.e. (64)60% were males and 42(40%) were females. Majority of patients i.e. 42(40%) were in the age group of 45-60 while 32(30%) were above 60 years age. Most common indication for surgery was impacted tooth extraction followed by excision of a cyst. A total of 12 patients (11.3%) developed post operative complications out of which 2 developed surgical site infection and 10 developed an anastomotic leak without a distinct infection sign. The correlation between postoperative complications and clinical factors including gender, age, diabetes, respiratory disorder, cardiovascular disease, preoperative serum albumin level, blood loss volume, and operation time (Fisher's exact test) was determined. We found a significant relationship between postoperative complications and diabetes ($p < 0.05$), preoperative serum albumin level ($p < 0.05$), and operation duration ($p < 0.05$).

Among the continuous variables, preoperative serum albumin, blood loss volume, and operation duration were examined using a Mann-Whitney U test for nonparametric statistical analysis. Preoperative serum albumin level was significantly lower in patients who developed a surgical site infection or anastomotic leak ($p < 0.05$). In addition, blood loss volume ($p < 0.05$) and operation duration ($p < 0.05$) were significantly increased in patients with postoperative complications.

DISCUSSION:

The advancement in oral surgery has brought down the complication rates but still if postoperative complications develop, they result in prolonged hospital stay and reduced quality of life in affected patients. Thus, it is important to identify risk factors associated with postoperative complications and eliminate them as much as possible. In our study, we examined some clinical factors to determine their relationship with postoperative complications such as surgical site infection and anastomotic leak. Of 12 cases with complications, 2 had an apparent infection in the surgical region, whereas most (6) had an anastomotic leak. In our patients, the administration of antibiotic

prophylaxis may have reduced the opportunity for infection, resulting in the relatively small number of surgical site infection cases.

Serum Albumin in particular, is thought to be a reliable marker of nutritional status in patients following surgery (8), with a decreased level associated with rheumatoid disease, indicating it as a promising marker of inflammatory disease (9). Thus its level is considered to be a significant and useful factor to assess malnutrition and inflammation in patients. In addition, serum albumin is thought to be a predictive nutritional parameter for patients with head and neck cancer (10). The present study showed that decreased preoperative serum albumin was associated with postoperative complications in patients who underwent oral surgery. This was in accordance with a previous study which showed that preoperative albumin level in serum was a significant risk factor for surgical site infection in those who underwent primary resection, and head and neck reconstructive surgery (4). Thus, it may be possible to reduce the risk of surgical complications by improving their nutritional status (11).

Our results also showed that prolonged operation duration and increased blood loss volume were associated with more postoperative complications in the evaluated patients. These clinical parameters are however dependent on the severity of the surgical procedure and skill of the surgeon. There are studies which have identified significant associations of operation time and blood loss with surgical infection in patients who underwent head and neck surgery (4,5,7) while some studies have noted no significant relationships between those in head and neck cancer patients (3). It is therefore important to minimize blood loss and reduce operation time by improving surgical techniques and therapeutic strategies.

Although long-term glycemic control may have an influence, the effect of diabetes on postoperative complications remains unclear. In few studies of head and neck cancer patients, no significant correlation between diabetes and surgical infection was found (3,5,7). Further investigations are necessary to clarify the effect of diabetes on patients who undergo oral surgery.

CONCLUSION:

The present study concludes that diabetes, hypoalbuminemia, increased blood loss volume and prolonged operation duration are significant risk factors for postoperative complications in patients undergoing oral surgery.

Table 1 Showing The Surgical Procedures Performed In The Present Cases

Surgical procedures	Patients (%) (N=106)
Impacted tooth extraction	37 (34.9%)
Excision of jaw bone cyst/radicular cyst	32 (30.1%)
Fixation of mandibular/maxillary fracture	14 (13.2%)
Resection of benign tumor	11 (10.4%)
Jaw bone osteotomy for jaw deformity	8 (7.5%)
Sinus lifting	2 (1.8%)
Removal of sialolith	1 (0.94%)
Bone graft	1 (0.94%)

Table 2 Showing The Correlation Between Clinical Characteristics And Post Operative Complications

Clinical characteristics	Postoperative complications (n=12)		P value
	Yes	No	
Gender			0.6
Male (64)	8 (12.5%)	56 (87.5%)	
Female (42)	4 (9.5%)	38 (90.5%)	
Age in years			0.67
<60 (74)	8 (10.8%)	66 (89.2%)	
≥60 (32)	4 (12.5%)	28 (87.5%)	
Diabetes			<0.05
Yes (24)	6 (25%)	18 (75%)	
No (82)	6 (7.3%)	4 (92.7%)	
Cardiovascular disease			0.72
Yes (21)	2 (9.5%)	19 (90.5%)	
No (85)	10 (11.7%)	75 (88.3%)	
Respiratory disease			0.62
Yes (24)	2 (8.3%)	22 (91.7%)	
No (82)	10 (12.1%)	72 (87.9%)	

Pre-operative serum albumin			<0.01
<4g/dl (16)	4 (25%)	12 (75%)	
≥4g/dl (90)	8 (8.9%)	78 (91.1%)	
Blood loss			<0.05
≥300ml (5)	2 (40%)	3 (60%)	
<300 ml (101)	10 (9.9%)	91 (90.1%)	
Operation time			<0.01
≥120 min (16)	4 (25%)	12 (75%)	
<120 min (90)	8 (8.9%)	12 (91.1%)	

Fisher exact test.

Table 3 Showing A Correlation Between Postoperative Complications And Serum Albumin Level, Blood Loss, Or Operation Time

Variables	(-)	(+)	p value
Preoperative serum albumin (g/dL)	4.63 ± 0.38	4.13 ± 0.46	<0.05
Blood loss (mL)	64.5 ± 132.5	104.2 ± 148.5	<0.05
Operation time (min)	82.5 ± 71.2	108.4 ± 75.2	<0.05

Mann-Whitney U test was utilized for nonparametric statistical analysis

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