

Introduction

- Head and neck cancers are the sixth most common cancer; causing more than 350,000 deaths annually
- Pakistan falls geographically in a high-risk area for oral cancer.
- More challenging in Low and middle income countries due to limited resources
- Radical head and neck dissection with a free flap is an extensive procedure
- This procedure usually require large volumes of fluid.
- Anesthetic care has a fundamental role by regulation of hemodynamics and regional blood flow
- There is scant regional and no Local data

Objective

Primary Objective:

- To evaluate the impact of intraoperative fluid administration and its correlation with the postoperative medical and surgical complications in head and neck cancer free flap surgeries.

Secondary Objective:

- To identify demographic, preoperative and intraoperative factors predicting postoperative complications

Material & Methods

Study design

- Retrospective observational study

Inclusion Criteria

- Elective head and neck cancer free flap procedures
- Age 18 – 65 years
- ASA I - III

Exclusion Criteria

- Patients with revision head and neck surgical procedures
- Patient receiving micro-vascular reconstruction as a salvage procedure for a previously performed free flap surgery
- Patients with history of head and neck cancer radiotherapy

Duration Of Study

- 5 years

Methodology

- Approval from departmental research committee and hospital ethical review committee was obtained
- A retrospective review of all patients who underwent free flap procedures for head and neck cancer between January 2014 and December 2018 was conducted
- Medical records, including anaesthetic charts were reviewed
- A Performa was specifically designed for this study

Data Analysis

- All analyses were conducted by using the Statistical Package for Social Science version 19 (SPSS Inc., Chicago, IL)
- P value of ≤ 0.05 was considered statistically significant

Results

Demographic and clinical characteristics of patients (n=224)

Variables	Point Estimate
Age (Years)	45.74±10.46 [Range: 19-68]
Gender	
Female	32(14.5%)
Male	192(85.7%)
Co-morbid†	68(30.4%)
Hypertension	35(15.6%)
Diabetic Mellitus	10(4.5%)
IHD	9(4%)
COPD	14(6.3%)
Asthma	14(6.3%)
Anemia	8(3.6%)
Others	12(5.7%)
History of Addiction	
Smoking	92(41.1%)
Betel Nut	123(54.9%)
Others	26(11.6%)
Diagnosis	
Buccal Mucosa SCC	176(78.6%)
Tongue SCC	18(8%)
Lip SCC	3(1.3%)
Mandible SCC	10(4.5%)
Maxilla SCC	4(1.8%)
Ameloblastoma	5(2.2%)
Lower Alveolar SCC	7(3.1%)
SCC Floor of Mouth	1(0.4%)

Performed Procedure/ Intraoperative Fluid Information (n=224)

Variables	Point Estimate
Procedure	
Fibular Flap	83(78.6%)
ALTF	104(46.4%)
Radial Forearm Flap	22(9.8%)
Lateral Arm Flap	15(6.7%)
Duration of Anaesthesia (min)	641[558 – 736]
Duration of Surgery (Min)	569[479 – 644]
Length of hospital stay (days)	5[4 – 5]
Blood Loss (ml)	697[500-1000] {Range: 60-2000}
Total Intraoperative Fluid (n=224)	4600[3525-5500]
Total Crystalloid (ml) (n=224)	4000[3500-5000]
Ringer Lactate (n=209)	4000[3000-4500]
Normal Saline (n=71)	1000[500-3000]
Others: 5% Dextrose (n=4)	500[425-575]
Total Colloid (ml) (n=145)	600[500-1000]
Natural (n= 76)	600[300-600]
Packed Red Cell (n=77)	600[300-600]
Fresh Frozen Plasma (n=1)	300*
Platelet (n=1)	100*
Synthetic (n=121)	500[500-500]
Gelatin (n=115)	500[500-500]
Haemaccel (n=8)	500[500-500]
Albumin (n=0)	Nil

Post-operative complications	Point Estimate
Medical Complications	70(31.25%)
Pulmonary	10 (4.5%)
Renal (Acute Kidney Injury)	23 (10.3%)
Infectious (Sepsis)	9 (4%)
Cardiovascular	12(5.4%)
Hematologic (Deep Venous Thrombosis)	0
Unplanned mechanical ventilation / ICU admission	9(4%)
Others	7(3.1%)
Surgical Complications	18(8%)

Comparisons of characteristics of patients with and without Complications.

Variables	With complication n=58	Without complication n=166	P-Value
Age (Years)	45[37-55]	45[37-54]	0.814
Gender			0.575
Male	51(87.5%)	141(84.9%)	
Female	7(12.1%)	25(15.1%)	
Co-morbid	25(43.1%)	43(25.9%)	0.014
Smoking Status	28(48.3%)	64(38.6%)	0.195
Betel nut	30(51.7%)	93(56%)	0.570
Duration of Anaesthesia (Min)	645.5[548.5-738.5]	635[563-732.7]	0.688
Duration of Surgery (Min)	549[466-629]	572[488-650]	0.693
Length of Hospital Stay (Days)	5[4-6]	5[4-5]	0.019
Total fluid (mL)			0.273
≤5000	32(55.2%)	106(63.9%)	
>5000	26(44.8%)	60(36.1%)	
Use of colloid	41(70.7%)	104(62.7%)	0.338
Natural Colloid	20(34.5%)	56(33.7%)	0.998
Use of packed red blood cells	21(36.2%)	57(34.3%)	0.873
Fresh Frozen Plasma	0	1(0.6%)	0.999
Use of Platelet	0	1(0.6%)	0.999
Use of Gelatin	34(58.6%)	81(48.8%)	0.224
Use of Haemaccel	4(6.9%)	4(2.4%)	0.210
Use of phenylephrine	0	1(0.6%)	0.999
Use of Non-phenylephrine	2(3.4%)	0	0.066

Comparison of different fluid concentration in patients with and without complication

Variables	With complication	Without complication	P-Value
Total Fluid (ml)	n=58 5000[3900-6075]	n=166 4550[3500-5500]	0.156
Total Crystalloid (ml)	n=58 4250[3500-5125]	n=166 4000[3500-5000]	0.242
Ringer Lactate	n=56 4000[3000-5000]	n=153 4000[3000-4500]	0.527
Normal Saline	n=18 1000[500-2750]	n=53 1000[500-3000]	0.780
Total Colloid (ml)	n=41 800[500-1050]	n=104 550[500-1000]	0.328
Natural Colloid	n=20 600[300-825]	n=56 600[300-600]	0.321
Packed Red Cell	n=21 600[300-750]	n=57 600[300-600]	0.369
Synthetic	n=35 500[500-500]	n=86 600[300-625]	0.569
Gelatin	n=34 500[500-500]	n=81 500[500-500]	0.211
Haemaccel	n=4 500[350-875]	n=4 500[400-750]	0.999

Discussion

- Till date, there has been no definitive consensus regarding optimal fluid protocols for patients undergoing H & N free flap.
- Generally, complications occurs in H&N free flap when fluid transfusion exceeds above 4000-5000ml
- However in our study, more complications were noted in <5000ml fluid group.
- AKI was the most common medical complication.

Conclusion

- We did not find statistically significant frequency of flap related complications associated with amount and type of intraoperative fluid administration in free flap H&N cancer surgery

Reference

Characteristics and intraoperative treatments associated with head and neck free tissue transfer complications and failures. Otolaryngol Head Neck Surg