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Research Article

Postoperative Management of Patients with Cervicofacial Free Flap in Surgical Intensive Care Unit: An Updated Clinical Protocol

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ARTICLE INFO

Article history:

Received: 14 May, 2020

Accepted: 27 May, 2020

Published: 2 June, 2020

Keywords:

Free flap

postoperative surveillance

postoperative complications

ABSTRACT

Postoperative management of complex cervico-facial cancer tumor removal followed by free flap reconstruction is evolving since its early beginning 20 years ago. Flap surveillance is a major goal in this period, however the management of comorbidities to predict a favorable outcome cannot be neglected. Based on our experience in this field and recent literature we updated our postoperative management protocol which focus on management of different comorbidities to maintain favorable outcome for the graft and the patient.

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Introduction

Excision of head and neck tumor cancer and reconstructive microvascular surgery of free flap to replace defect or secondary reconstruction after removal of damaged tissues such as osteoradionecrosis are complex challenges in cervicofacial cancer patients. Our institution is a major leading hospital in Europe for head and neck cancer and reconstructive surgery. Free flap reconstruction in our cancer hospital started 27 years ago, we have a current rate of 150 free flap per year and 6 percent failure [1]. Most of the time a double team of cervico-facial and reconstructive surgery surgeons perform simultaneously these procedures which usually last several hours. We recently updated our clinical anaesthetic management for these patients and in this report, we extend our update to postoperative care management.

It is generally accepted that factors influencing final success of these procedures are mainly related to surgery and the patient itself such as vessel caliber and comorbidities, while anaesthesia related factors have a lesser impact [2]. In addition, duration of anaesthesia which in fact is related to duration of surgery has a negative impact as is preoperative radiotherapy [3, 4]. Nevertheless, this does not mean intraoperative anaesthetic technique has no effect at all since according to Hagen Poiseuille equation blood flow to the flap has a direct relation to systemic blood pressure [5]. In addition to free flap failure other complications such as hemorrhage, infection (local or sepsis) or respiratory insufficiency can at least increase the length of stay in the hospital without compromising the flap itself. Postoperative management can also be a confounding factor in the overall general process. Adequate surveillance of the free flap is fundamentally important for the survival of the graft nevertheless surveillance alone is not sufficient and multiple other medical aspects should be considered.

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Updated Postoperative Surgical Intensive Care Unit (SICU) Protocol

Airway Management: Anticipate with surgeon any postoperative airway management difficulty, if tracheotomy is not performed 24h intubation may be considered. If a tracheotomy is in place the cuff should be deflated at day 1. The first tracheotomy cannula should be changed by cervicofacial surgeon / resident in day 3 in the SICU. An external functional humidifier should be installed for the tracheotomy. Daily respiratory physiotherapy should be prescribed.

Postoperative Analgesia: Multimodal analgesia: paracetamol, Nefopam, Non-Steroidal Anti-Inflammatory Drug.

If a peripheral catheter is deployed for postoperative regional analgesia: 0.2% ropivacaine 5 ml/h for 48 hours maximum or 1 bottle of DOSI-FUSER®. Morphine Patient Controlled Analgesia for 72 hours followed by oral or subcutaneous morphine.

Enteral Nutrition and Early Rehabilitation: Enteral nutrition at day 1 mostly by nasogastric tube in case of major pharyngo larynx surgery. The position of the tube should be checked before the start of enteral nutrition. For jejunum graft the enteral nutrition is delayed for several days in coordination with surgeons. Early movement passive and active progressive physiotherapy. Masticatory and facial exercises should start as soon as possible.

Thromboprophylaxis: Enoxaparin 4000 UI / 24h SC to start 6 hours after the end of flap anastomosis, for 28 days. If BMI > 40: enoxaparin 4000 x 2 / 24h. Flap surveillance. Clinically (color) or by any available monitor measuring skin oxygen saturation. Check the absence of mechanical compression of the flap. Haemoglobin should be maintained above 9g/dl.

Antibioprophylaxis: Amoxicillin-clavulanic acid 1g x 4 / 24h IVL for 24h. If allergy: Clindamycin 600 mg x 4 / d. In case of Osteoradionecrosis: Pieracillin/tazobactam 4g x 4 / 24h should be adapted to renal function, after sampling during surgery, to be secondarily adapted to the final bacteriological results and prolonged up to 3 weeks.

Prevention of alcoholic withdrawal syndrome: If patient not previously weaned or history of complicated alcoholic syndrome withdrawal. Fluid and electrolytes 1500 ml / 24h + vitamins (B1, B6, PP). Water on demand or through the nasogastric tube. Diazepam according to protocol and Cushman score.

Discussion

Our protocol is inspired by our experience and updated literature [6]. We extended the duration of stay in the SICU from 48h to 72, mainly because these patients needs extensive nursing care however in some studies it appears that there is no difference in complication between global SICU care and specialized surgical wards, however 72H appears to be an average time for the more complex procedures [7-9]. There is no difference between an open and closed ICU care for the outcome of these grafts [10]. Although some authors preconizes even a step down hospitalization with the same rate of complications and even less time

hospital stay, we believe the surgical ICU is most appropriate in terms of surveillance but also the necessity of appropriate nursing care since in a stepdown unit less nursing staff is dedicated per patient [7].

Immediate postoperative extubation reduces the length of stay in the ICU and other complications to systematic tracheotomy; however, if there is a potential difficult reintubation in relation to the flap or laryngeal swelling or any other vital procedures, anticipation is mandatory to avoid catastrophic emergency airway management [11]. In this context cook reintubation guide or similar devices, rescue jet ventilation, or one-night delayed extubation depending on night resources should be considered [11-13]. Regional anaesthesia has its own benefit in this context by reducing pain scores, morphine consumption and perhaps even the length of stay in the hospital [14-16]. The nutrition status of patients with head and neck cancer and having microvascular flap has potentially influence in 5-year survival and remission. It is reported that lower underweight BMI who are 53% subject of recurrence while overweight high BMI are 20%. Therefore, fast adequate nutrition mostly enteral and rehabilitation is a precondition of success for these procedures as frailty index predict critical care support [17]. In a prospective case-controlled study, we found high BMI was a risk factor for flap failure in addition to low haemoglobin [18].

The incidence of deep thromboembolism in patient with cervicofacial cancer with reconstruction is higher than other surgical patients. There is consensus among experts to use mechanical and /or pharmacological method of antithromboprophylaxis [19-22]. The effect of higher dose versus lower dose of chemoprophylaxis impacting postoperative bleeding and venous thromboembolism of the flap has been assessed and no significant difference was observed in one study [23]. In our experience antithrombotic prophylaxis remains widely indicated and flap repaired patients need extended time of antibioprophylaxis [24]. Postoperative medical complications not microsurgical complications inversely influence the morbidity/mortality after microsurgical reconstruction for head and neck cancer however clinical surveillance of the graft is a major justification for these patients to be monitored in the surgical ICU, in addition to clinical surveillance multiple monitoring tools are available and might be used in this purpose [25-29].

Duration of antibioprophylaxis is debated extensively however it appears that short term (24h) is the optimal period, in some studies clindamycin is reported to increase the risk of wound or surgical site infection [30]. Patients with postoperative alcoholic withdrawal syndrome will more likely yield complications especially respiratory problems [31, 32]. The identification of these patients pre and postoperatively is mandatory in order to adapt optimal care [33]. Postoperative critical care in head and neck cancer patients having free flap surgery must focus on both flap surveillance and other medical pathologies in order to minimize complications and protocol guidelines should regularly be updated.

Conflicts of Interest

None.

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