

Emergency Damage Control Surgery in the Royal Danish Airforce Aero Medical Evacuation Squadron and the Army Surgical Team

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Abstract

In the spring of 2014, a team of surgeons from the Royal Danish Air force (RDAF), the Army Surgeon Team and a surgical team from Aalborg University Hospital was assembled to discuss future cooperation, joint military (Værnsfælles) medical capabilities and concept development. The outcome of the meeting was an effort to implement the Army Surgical Team (Damage Control Surgery (DCS)) team into the existing RDAF MEDEVAC Intensive Care Unit Module. The second assembly was held in the MEDEVAC SQN hangar at Aalborg Airbase and the personnel of the two teams' networked and medical materiel and assets, including blood warmers, monitors, surgery platforms etc., was tried to incorporate / integrate in the ICU module.

Keywords: Royal Danish air force; Surgeon, Damage control surgery; Monitors

Abbreviations: RDAF: Royal Danish Air force; DCS: Damage Control Surgery; NATO: North Atlantic Treaty Organization; SOST: Special Operation Surgical Team.

Introduction

The solution chosen was utilizing an oldfashioned trestle table for NATO Litters as a surgery table and clearing the walls for all unnecessary items though maintaining the mounts for monitoring equipment. After on ground exercise, a real time life exercise was planned, which included life tissue training (porcine model), a Special Forces Team, a C130J, a team from the Biomedical Research Laboratory at Aalborg University Hospital and the recently formed joint military capability Damage Control Surgery team?

Case Report - Live Exercise

In the early fall of 2014 a Hercules C130J landed on the beach

of the west coast of Denmark. The aim was to extract and perform initial surgical treatment on a severely wounded soldier from a Special Forces Team. The wounded soldier, simulated by a porcine, had multiple traumas due to severe gunshot wounds in the thoracic chest, abdomen, upper arm and lower limbs. The patient was taken in to the MEDEVAC Intensive-Surgery (ICU-S) module, anaesthetized and Damage Control Surgery was performed by the Army DCS team. The surgery performed was pleural drainage, splenectomy, nephrectomy, end-to-end ileal-anastomosis, limb amputation and liver package. After 60 minutes of life saving surgery the patient was hemodynamically stable and the C130J took off from the beach and performed a round trip for approximately 1.5 hours in Danish airspace, before landing at Aalborg Airbase. At the time of landing, the patient was in a stable condition and vital signs within acceptable parameters [1] (Figure 1).



Figure 1: MEDEVAC Intensive-Surgery.

Perspectives

In the near future, it seems feasible to perform lifesaving Emergency Damage control Surgery, necessitated by life threatening massive hemorrhage or cardiopulmonary system failure, en route while airborne in the RDAF MEDEVAC SQN. Further perfection of the EDCS team working ergonomics (e.g. install a proper surgical table) and personnel flying safety must be undertaken. Further research needs to be carried out regarding apneic oxygenation and the possibility to implement and perform highly specialized treatment en route by the thoracic surgery team [2]. Implementation of ultrasound diagnostics (FATE/FAST) in the RDAF MEDEVAC ICU-S module concept is of crucial importance [3]. The ultrasound image technology can also be used by the surgical team to identify blood vessels of importance for cannular interventions. The introduction of the Human (Plasma) proteins (recombinant) for blood acute blood transfusion in the hemodynamically unstable patient must be investigated [4-6]. By introducing this EDCS concept to NATO allies, it would be possible to have a MEDEVAC concept which could be used to evacuate unstable patients from high risk conflict zones, where there is no opportunity or facility to perform lifesaving DCS on wounded personnel. The EDCS concept can easily be incorporated in the Special Operation Forces SOST (Special Operation Surgical Team) concept [7,8]. Additionally it would be possible to utilize the time for continuous lifesaving interventions during strategic MEDEVAC (the Diamond period) in continuation of the Platin Quarter and the Golden Hour concept in the continuing chain of survival.

Discussion

Issues of force protection (DCS team) must be addressed during flight. It is already accepted to “walk around” and treat ICU patients while airborne en route in the ICU module, when there is stable / steady weather conditions. There is and must be a well-established communication between the ICU-S team and the pilots due to information about weather conditions/forecast (e.g. turbulence), duration of flight, departure, landing etc. to ensure that DCS can be performed

relatively safe, both for the patient and the DCS team. It is appropriate to draw attention to the fact, that without surgery, the patient mortality will be very high in a bleeding hemodynamically unstable patient.

Conclusion

It seems possible to perform safe Emergency Damage Control Surgery while airborne in the RDAF MEDEVAC ICU-Surgery module. The Emergency Damage Control Surgery term / team is a new Aero Medical Evacuation en route concept. Surgery should only be undertaken in situations, with no other options available to ensure patient survival (back against the wall situation) and where the flying weather conditions are stable (cruising altitude, turbulence etc).

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