

Short communication

Craniofacial war injuries

O.M.M. Salama¹

الإصابات القحفية الوجهية الناجمة عن الحروب

أسامة مصطفى محمد سلامة

الخلاصة: تتناول هذه الورقة بيان المفاهيم الحديثة في معالجة الجروح التي تصيب المنطقة الوجهية الفكوية العلوية من جراء الحروب. كما تعرض بإيجاز الفروق بين الممارسة الطبية العامة والممارسة الطبية العسكرية.

ABSTRACT In this paper, recent concepts in the management of war wounds of the maxillofacial region are described. A brief differentiation is also given between general practice medicine and military medicine.

Blessures de guerre de la face et du crâne

RÉSUMÉ Le présent article décrit les conceptions récentes du traitement des plaies de guerre touchant la région maxillo-faciale. Une brève différenciation est également établie entre la médecine générale et la médecine militaire.

¹Department of Prosthodontics and Implantology, Faculty of Dentistry and Oral Medicine, University of Cairo; Department of Field Surgery, Military Medical Academy, Cairo, Egypt (Correspondence to O.M.M. Salama: osama_salama61@hotmail.com).

Received: 30/05/04; accepted: 29/03/05

Introduction

At no other time since the Second World War have more countries been involved in hostilities than now. Of the some 215 wars that have been fought on the globe since 1945, approximately 132 were domestic conflicts; the others involved 2 or more countries [1]. By the available estimates, these conflicts have cost more than 25 million lives. The total number of war-wounded (in Greece, Korea, Vietnam, Cambodia, Afghanistan, Egypt, Lebanon and elsewhere) was 5 times the number of deaths. Wounds of war generally stem from injuries inflicted by projectiles from firearms. These accounted for some 97% of wounds in the Second World War. War wounds of the maxillofacial region ranged from 8% to 15% [1].

The therapy of these wounds is extremely complex. It incorporates optimal medical first aid, preserving vital functions; continuing care, consisting of definitive surgical and medical care of the wound; and, rehabilitation, aimed at compensating for functional damage and aesthetic defects [2].

The aim of this work was to describe recent concepts in managing war wounds of the maxillofacial region under severe combat conditions, and to give a brief differentiation between general practice medicine and military medicine in casualties that may be admitted to military or civilian hospitals in wartime.

War injuries

In war and under severe combat conditions, military medicine differs from general practice medicine in a number of respects. For example, the nature of casualties and the combat conditions which accompany them may endanger the wounded as well as the doctor and the facility. Hospitals may suddenly have to contend with high, and vari-

able, numbers of casualties within a short period of time. Under combat conditions in the field, resources may be limited (e.g. a lack of equipment to cover the numbers of casualties and the types of injuries) and technical conditions different (e.g. operating in a tent; being obliged to make instant decisions over who to treat immediately and who to leave). Both military and civilian hospitals may have to deal with these.

A system of staged treatment, in which the casualty gets preplanned, limited medical treatment at each stage, has been developed. This incorporates first aid, first medical aid, qualified treatment and specialized treatment, besides supervision of the preparation of casualties for evacuation from the front to the rear hospitals. This means that a succession of doctors at different military hospitals perform definitive treatment procedures on the same casualty. Also in this system the type of casualty is anticipated: in the tank battalions most of the casualties suffer from burns and fractures as well as concussions, while in the infantry battalions the casualties suffer mainly from missile and blast injuries, so the number of casualties can be precalculated according to the type and severity of the battle.

Civilian doctors may not be aware of the diagnosis or treatment of some of the injuries which occur during modern warfare. A military doctor deals with a high incidence of bullet wounds; severe tissue injuries from explosive devices; burns and multiple injuries caused by modern very high and ultra-high velocity missiles, incendiary weapons such as napalm and white phosphorus bombs; injuries caused by antipersonnel bomblets; pellet injuries; injuries caused by mines and modern high explosive anti-tank missiles; and lastly, the possibility of casualties of nuclear, biological or chemical warfare. This is besides conditions related to specific occupations and military

environments such as aviation and space medical problems and injuries, underwater diseases, and irradiation and radar syndromes.

Casualties may need to be rescued, picked up, classified, stabilized, registered and evacuated to the rear military hospitals under severe combat conditions, which will adversely affects their management [3].

Craniofacial war injuries

Auricular war injuries

The loss of 1 or both ears is a significant craniofacial war injury. The high specific gravity [4] of the auricular tissue results in its partial or total loss when injured by a high velocity or very high velocity missile or secondary missiles generated by an explosion.

The exact number of patients with total auricular defects is not known, but the yearly global incidence has been estimated to be 6 for every million inhabitants [5,6].

Midface war injuries

The loss of the nose (alone or with multiple fractures of the maxilla), zygomatic arch or both, is a significant craniofacial war injury. Because the tissue (bony tissue) in this area has the highest specific gravity, wound severity is extreme, causing its partial or total loss when injured by a high velocity or very high velocity missile or secondary missiles generated by an explosion [4].

Low velocity missile injuries

Low velocity missile wounds are entirely localized: the tissues affected are those which come in contact with the missile. Entry and exit wounds are small and usually more or less similar in size [7]. Management of such injuries is not complicated unless associated with vascular or visceral injury.

High velocity missile injuries

In high velocity missile injuries, management is entirely different. Cavitation is extensive and, consequently, tissue destruction will be more severe. A strong shock wave is created by the speed of the missile. This is sufficient to cause motion of the tissue particles 3 times faster than the sonic velocity of the tissue concerned. Very high velocity missiles, where projectiles are fired at velocities of 1542 m/second or above, invariably cause extensive explosive damage of several centimetres in all directions from the point of impact, and have no exit [7].

Tissues are flung away from the missile's track, causing secondary missiles, which add to the gravity of the condition. Tissue disruption, cavitation, rupture of blood vessels and nerves and fracture of bones may take place in parts distal from the site of the path. Distant effects of vascular injuries in the form of thrombosis, extravasation and oedema frequently occur. The introduction of dirt and foreign material will make infection inevitable in such cases [4].

There is widespread opinion among experts that debridement is the safe method of treating missile injury to soft tissue. In some instances, a secondary debridement has been done, especially in cases where bones were implicated. Infection was reduced by 70%, together with a reduction in the period of hospitalization [4].

The devitalized ragged skin edges should be trimmed, adequate fasciotomy should be done to facilitate the inspection of underlying muscles. Excision of fascia should be conservative.

Saline wound irrigation, preferably carried out under pressure before deeper wound debridement, makes debridement more limited and a muscle that seemed to deserve excision to appear evidently viable. Thus,

it helps in limiting the number of unnecessary excisions. In addition, the incidence of wound infection is greatly reduced [4].

Exploration of major blood vessels in the vicinity of the missile track should be performed and grossly damaged tissues and foreign material removed.

Loose bone fragments completely detached from the periosteum should be removed. Another saline wound irrigation is advisable before final, thorough haemostasis is achieved. The wound is then dressed with sterile gauze without drains or packs being applied, ensuring free and adequate drainage of the deep part. Haematoma formation and likelihood of infection are thus sometimes avoided.

As infection is frequently found to be unavoidable, it is stressed that massive antibiotic therapy should be started as early as possible in a full dose.

The dressing should be left in place until the time of delayed primary suture, which is usually carried out after 4–6 days, according to the condition. Wound closure is done in layers, without tension, which may cause necrosis of the sutured edges. If sloughs are found, secondary debridement is performed. Among 262 cases of missile injuries during the 1973 6th October War (Yom Kippur War) in Sinai between Egypt and Israel, 38% needed secondary debridement and 6% needed tertiary debridement [4].

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