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Contents

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President's Notebook

Hello! Since the new CAEP Executive took office as of October 1st, you'll now read my editorials on these pages instead of elsewhere in the Review. What I hope to do with the "Notebook" this year is to begin with a few items of news and information to the membership, but then devote most of the column to an editorial on an issue of importance to Emergency Physicians. Please feel free to send letters back to the editor, to generate some debate.

Recently, many of you will have written the first ever Fellowship examinations in Emergency Medicine of the Royal College. Most will be preparing for the orals to come in a few months. Others will be preparing for the second CFPC certification examination in Emergency Medicine. As a result, by year's end, we will be in the unfamiliar position of having several members with a variety of letters after their names, rather than none. I hope this will be a positive thing for CAEP – both groups should look to CAEP as the voice of Emergency Medicine and Emergency Physicians in Canada. There remains a real need for this organization to set standards of care, to foster research, and to represent the interests of Emergency Physicians.

A very positive development this year has been the interest shown by members in our call for a broader participation in the working groups. There has been a surprisingly large response to the request for members for these working groups, and hopefully they will be able to recommend some practical policy options for us for the Vancouver meeting in April.

The Trauma Association of Canada is to have had its founding meeting in Calgary by the time of printing. We have argued vigorously for the involvement of Emergency Physicians in this and I will send you all some information shortly regarding the new Association and our role in it.

Finally, please set aside the first week in April for CAEP's fifth annual meeting in Vancouver. Sheldon Glazer and his committee are well along in planning an excellent meeting from both an academic and a social point of view. Original scientific papers are invited, and again an award will be given. And what a great time to be in B.C.!

On Specialty Chauvinism

"Sure you take care of these types of patients all the time, but if we want this to have any credibility, we'll have to get the specialist involved."

How many times has that been said to Emergency Physicians? Perhaps the greatest deterrent to the development of the specialty of Emergency Medicine in North America is this Specialty Chauvinism. And it's rampant! For years we've encountered this attitude in our own hospitals and communities. CPR committees are chaired by internists, ACLS courses "must" have a cardiologist involved, prehospital care committees are chaired by anaesthetists. Why? Who knows more about resuscitation and prehospital care? When was the last time you saw an internist or a cardiologist running an arrest? When was the last time you saw an anaesthetist in the back of an ambulance or talking on the radio?

Two recent political events have demonstrated this graphically to me. In discussions with a senior member of a provincial government, I learned that a Provincial Emergency Health Services Advisory Group was to be set up. Great! But wait a minute – the Chairman was to be a anaesthetist. The same old tune. Not only that, but of the seven other suggested members named, *not* one was an Emergency Physician. Rather, there was an intensivist, a general surgeon, a neurosurgeon, an Emergency nurse, a consumer, an ambulance service manager, and a hospital administrator. Not one Emergency Physician. Incredible!

When, in my polite way, I questioned the Ministry official on this point, he suggested that "Emergency Health Services goes way beyond the Emergency Room". Of course, and so does Emergency Medicine – to prehospital care, disaster planning, designated trauma and burn centres,

categorization, rationalization, etc. "But we need the specialists to give it credibility." Of course you do, so why not stack it with "specialists" in prehospital and first hour care. The Royal College exams have been devised to examine us at the level of any specialist in the first hour of care of any illness or injury. And Emergency Physicians are the most "system oriented" physicians I know. An Emergency Health Services Committee without them will have no credibility at all.

Trauma care is another example, and one near and dear to me. For the past two years, CAEP has been integrally involved in the movement to establish the new Trauma Association of Canada. It has been a tough struggle to get it out from under the aegis of the Canadian Association of General Surgeons. With all due respect to our colleagues, it has been primarily this same specialty chauvinism which has, in part, delayed the advancement of trauma care in Canada. Trauma, perhaps more than anything else, demands the "unfettered overview" of the Emergency Physician, to perform the primary survey, to establish treatment priorities, and to lead the team. Yet, at the organizational level, there has been a tremendous resistance to the involvement of Emergency Physicians in the new Trauma Association.

Yet studies continue to show that it is that systematic and interdisciplinary approach so integral to Emergency Medicine that is essential for major improvements in outcome of trauma patients. Today, and for the foreseeable future, the vast majority of trauma patients in Canada will be resuscitated for that "first golden hour" by Emergency Physicians.

Specialty chauvinism still exists, in a very big way, in the minds of physicians and bureaucrats in Canada. Having a few new letters after our name will not overcome it easily. Yet we must continue to strive to establish our discipline and ourselves, for the sake of our patients.

Peter Lane, M.D.
President CAEP

Scientific Section

"Journal Club"

by Ian Cordon, M.D.

1. *The Annals Of Thoracic Surgery.* April 1983. Vol. 35, pp 450-454.
R. Kirshner et al. Upper Rib Fractures and Mediastinal Widening: Indications for Aortography.

Kirshner et al. examine two of the doctrines of chest trauma. The association between first and second rib fractures and aortic tear is challenged both by literature review and clinical experience. The literature contained an association in only two percent of cases (no more than with other rib fractures) and analysis of two hundred and thirteen patients with major blunt chest trauma including rib fracture over a five year period showed: sixty four had first and second rib fractures, fifty one had third or fourth rib fractures, and ninety eight had fractures involving lower ribs only. There was one aortic rupture in each of the first two groups, and four in the third group. (No statistical difference). Over the same period there were twenty one patients with known aortic rupture, of these one had a second rib fracture, six had lower rib fractures and fourteen had no fracture.

The second issue examined was mediastinal widening. By using a mediastinum to chest ratio measurement the authors felt it was possible to allow for the often poor technique of the frequent portable and A-P chest films that are taken in patients with major chest trauma. At the level of the aortic knob and mid-descending aorta there was a statistical difference between the M/C ratio in patients with aortic rupture versus two control groups. The authors found a M/C ratio of 0.28 at the aortic knob was eighty five percent sensitive and a hundred percent specific and suggest this is an accurate indicator of those needing aortography regardless of the radiographic projection.

2. *American Heart Journal.* April 1983, Vol. 105, pp 548-553.
G. Suki and P. Farrell. Myocardial Infarction in Young Adults: Risk Factors and Natural History.

One hundred and sixty five patients under forty years with proven M.I. were compared with M.I. patients over forty years for prevalence of various risk factors. These were obesity (greater than twenty percent overweight), smoking (> twenty pack years), hypertension, Serum Cholesterol, positive family history, and Diabetes Mellitus. Overall the younger group had more of these conventional risk factors, averaging three versus two. Fifty eight percent of Group I were obese, thirty two percent of Group II; forty one percent of Group II were not obese, had no hyperlipidaemia, were not hypertensive and had no Diabetes whereas only seventeen percent of Group I lacked all these risk factors. The mortality rate in the younger patients was lower but the incidence of complications was similar.

3. *Annals of Internal Medicine.* May 1983. Vol. 98, pp 585-588.
M. Mirowski et al. Mortality In Patients With Implanted Automatic Defibrillators.

This is the first study to assess the usefulness of automatic defibrillators. Fifty two patient who had survived at least two (mean 3.9) cardiac arrests had automatic defibrillators implanted that were programmed to discharge initially for ventricular fibrillation and later for ventricular tachycardia also. While monitored in hospital the devices appeared highly successful, terminating eighty two episodes of spontaneous V. Tach in nine patients. The total mortality of these fifty two patients at one year was 22.9 percent of which one third (7.6%) was due to sudden death (presumed non-resuscitated cardiac arrest). The expected mortality rate was actuarially calculated at forty eight percent. Thus the one year mortality was more than halved by the presence of automatic defibrillators.

4. *American Heart Journal.* May 1983, Vol. 105, pp 738-743.
G. Hollander et al. Bundle Branch Block in Acute Myocardial Infarction.

Up to twenty nine percent of patients with Acute Myocardial Infarction (A.M.I.) develop an intraventricular conduction disturbance. Prophylactic pacemaker insertion in patients with A.M.I. and pre-existing or new bundle branch block (BBB) is a controversial subject amongst cardiologists.

The records of six hundred and six patients with proven A.M.I. were reviewed and a comparison made with previous studies. Complete BBB occurred in eight percent (literature eight to thirteen percent) and progression to high degree AV block occurred in thirty percent of these. One hundred percent of patients progressed to high degree A-V block if anterior wall A.M.I. and LBBB occurred together, and fifty percent of those with bifasicular block went on to high degree A-V block. The reported incidence of progression with pre-existing complete BBB is eighteen to thirty three percent but if only anterior wall A.M.I.'s are considered this becomes thirty five to forty four percent. The authors recommend prophylactic pacemaker insertion in patients with acute anterior wall M.I. and either old or new complete BBB. Others feel that A.M.I. complicated by new BBB has such a doubtful prognosis that there is no point in prophylactic pacing (since most die from pump failure).

5. *The American Journal of Medicine.* May 1983, Vol. 74, pp 845-851.
C. Fauta et al. Corticosteroids in Acute Asthma

There have been many attempts to objectively support the traditional clinical lore that steroids are helpful in the acute asthmatic attack; to date these have all been unsuccessful except in "steroid dependent" patients. The authors have shown in this random, double-blind trial that a statistically significant improvement in FEV_1 occurred in the group administered hydrocortisone as opposed to saline. This appeared ten hours after infusion and was sustained for at least twenty four hours. Blood gases were not significantly improved.

This study differs from the previous attempts as only patients who proved to be refractory to sympathomimetics and methylxanthines for eight hours were included. Thus those who respond quickly and may have had a statistically diluting effect in previous studies were weeded out. The authors suggest early use of corticosteroids in any acute asthamtic who does not rapidly improve to an FEV_1 of greater than forty percent. This paper's significance may be limited by the small

number (twenty patients), the inclusion of many patients who had previously received maintenance steroids, and that isoproterenol (as opposed to salbutamol) was the inhaled sympathomimetic.

6. *Annals of Surgery.* May 1983, Vol. 197, pp 520-530.
C. Goodwin et al. Randomized Trial of Efficacy of Crystalloid and Colloid Resuscitation on Haemodynamic Response and Lung Waler Following Thermal Injury.

The crystalloid versus colloid debate continues. Both sides claim the other solution is responsible for increased lung water content and contributes to A.R.D.S. Seventy nine burned patients (mean, fifty percent body surface) were resuscitated according to a crystalloid only or colloid containing (2.5%) albumin lactated Ringers Solution) protocol. Initially a lower volume was required in the colloid group. Initially lung water was higher (not significant) in the crystalloid group. By forty eight hours the lung water content was equal and continued to increase significantly, ($P < 0.0001$) during the seven day study period. Initially urine output was higher in the colloid group but by twenty four hours urine output was higher and thereafter easier to maintain in the crystalloid group. Eleven patients in the colloid group died while only three in the crystalloid group died (not statistically significant). Post burn dogma holds that a major factor in the inability of some patients to re-establish tissue perfusion is myocardial depression. Both groups showed a progressive climb in cardiac index and were in a hypercontractile state within twelve hours of injury.

The authors argue that while the hydrophilic property of albumin may be an advantage in initial resuscitation this is more than offset by deleterious effects over subsequent days. During this second period the body is attempting to mobilize massive quantities of edema fluid and the authors feel the addition of colloid impairs this process as demonstrated by difficulty maintaining urine output and a significant increase in lung water. They feel with slightly larger numbers the difference in mortality would have been statistically significant. The authors conclude crystalloid appears the preferred resuscitation fluid in acutely burned patients.

7. *The Journal of Bone and Joint Surgery.* March 1983, Vol. 65, pp 323-329.
P. Indelicato. Non-operative Treatment of Complete Tear of the Medial Collateral Ligament of the Knee.

Patients with a clinical acute complete tear of the medial collateral ligament (MCL) of the knee were anaesthetized and had the diagnosis confirmed by stressing the knee. The integrity of the cruciate ligaments and medial meniscus was defined by arthrosocopy. Those patients with a complete, isolated MCL tear were divided into two groups. Group I had the MCL repaired followed by six weeks of immobilization and then supervised rehabilitation. Group II had two weeks in a cast, four weeks in a cast brace and the same rehabilitation program as Group I. After two and a half years follow up the groups had no significant difference in knee strength and stability. Although the author concludes isolated MCL tears do not require surgery, I find it hard to believe many orthopaedic surgeons could resist the temptation since anesthesia and arthroscopy are a prerequisite to the diagnosis.

8. *The Journal of Bone and Joint Surgery.* March 1983, Vol. 65.
L. Hovelius et al. Recurrences After Initial Dislocation of the Shoulder.

This Swedish study contains two hundred and fifty seven patients with primary anterior shoulder dislocation who were prospectively investigated for dislocation recurrence during a two year follow up. Patients were treated either by immobilization for three to four weeks or by early mobilization as allowed by pain (after initial reduction). A third group was made up of those who failed to comply with the period of immobilization. The redislocation rates were the same in each group, but varied according to age. Patients under twenty two years had a recurrence rate of forty seven percent, age twenty three to twenty nine, twenty eight percent, and thirty years twelve percent. The association between fracture of the greater tuberosity and a good prognosis was noted, with zero recurrences in thirty two patients.

9. *Chest.* March 1983, Vol. 83, pp 461-463.
Thoracic Outlet Syndrome Mimicking Angina Pectoris.

Thoracic outlet syndrome occurs when there is compression of the subclavian artery or brachial plexus within the thoracic outlet. The usual symptoms are pain and paresthesiae along the C8-T1 distribution, chest pain occurs less frequently. The authors describe in detail four cases where thoracic outlet syndrome produced referred pain to the chest and left arm associated with a chronically raised CPK level. The patients had all been admitted to Coronary Care Units and had normal coronary arteriography and other extensive investigations. They eventually improved symptomatically and biochemically on a regime of anti-inflammatory agents and postural education.

10. *Diseases of the Colon and Rectum.* May 1983, Vol. 26, pp 323-326.
R. Orringer et al. Spontaneous Free Perforation of the Small Intestine.

The commonest causes of small bowel perforation are trauma and ischaemia. Spontaneous perforation is rare and carries a high mortality. This paper could better be entitled iatrogenic perforation as fifteen of the nineteen cases described were directly attributable to medical intervention (chemotherapy, radiotherapy, or surgery). All presented with abdominal pain and peritoneal signs but free air was seen in only seven radiographs, an ileus being demonstrated on three others of the nine patients with Crohn's Disease. Free air was seen on only one. All patients had had previous surgery. The authors feel their series mortality rate of thirteen percent was lower than that of the literature (twenty eight to forty two percent) due to early diagnosis and surgery, and urge a high index of suspicion. That most patients have a serious underlying disease process must also contribute to the generally high mortality and morbidity.

11. *The Journal of Trauma.* April 1983, Vol. 23, pp 317-321.
J. Smith et al. A Field Evaluation of the Esophageal Obturator Airway.

The E.O.A. has been extensively used in the setting of Cardiopulmonary Arrest and is approved for use in A.C.L.S. by the American and Canadian Heart Associations. It has been suggested that the E.O.A. may be superior to bag-mask and as effective as endotracheal intubation and ventilation. This study compared blood gas values from patients undergoing resuscitation from pre-hospital arrest with an E.O.A., and values from the same patients once an endotracheal tube was

substituted. There were statistically significant improvements, in PaO_2, $PaCO_2$ and pH once endotracheal intubation was accomplished. This is hardly surprising when one considers how much easier it is to administer good ACLS in a hospital setting. What is more alarming is that in forty seven percent of patients placement of the EOA took over four minutes and could not be accomplished at all in eighteen percent. Thus the "ease of placement" argument for the EOA seems invalid.

12. *The American Journal of Medicine*. March 1983. Vol. 74, pp 396-400.
B. Ribner et al. Treatment of Serious Infections with Moxalactam.

Moxalactam is a fairly new, very expensive, "third generation" cephalosporin. The Medical Letter recommends its use be restricted to life threatening sepsis where the pathogen is nuclear eg. newborn and elderly meningitis, some cases of gram negative septicaemia. This article presents ninety three patients with a wide range of infections who were treated with Moxalactam as a single antibiotic agent. Eighty two percent responded well, in eight of the nine failures there was obvious impairment of host defences. Fourteen Moxalactam levels, well above the M.I.C. were found in plasma, C.S.F., abscess fluid, bile and peritoneal fluid. The study illustrates the effectiveness of Moxalactam but its overuse should be avoided to prevent the emergence of resistant strains. The authors suggest its use in combination may help minimize this.

Meetings to note

8th Annual Course on Emergency Management

Dates: Thursday May 10, 1984, Friday May 11, 1984, Saturday May 12, 1984

Site: Holiday Inn (Downtown), 89 Chestnut Street (Behind City Hall), Toronto, Ontario, Canada

Sponsor: Toronto Western Hospital, Emergency Associates

Contact: Dr. Calvin Gutkin, Chairman, c/o Mrs. Sandy Atkinson, Secretary, Emergency Associates, 751 Dundas Street West, Toronto, Ontario, Canada M6J 1T9

Credits: Hour for hour credits (21 hours) applied for as in past years to The College of Family Physicians of Canada and The Canadian Association of Emergency Physicians.

Emergency Medicine

Dates: Core Curriculum Seminars, Ottawa, September 8, 1983, Cardiology, October 13, 1983, Neurology November 10, 1983, Infectious Diseases December 8, 1983, Toxicology II/ Dermatology

Time: 19:00-22:00 hours

Contact: Ms. R. Bradley, Emergency Department, Ottawa Civic Hospital, 1053 Carling Avenue, Ottawa, Ontario K1Y 4E9

Credits: Approved 3 hours Category I CAEP credits each

Fourth Annual Hamilton Post-Graduate Course in Emergency Medicine

Dates: April 17-April 24, 1983

Credits: Approved CAEP Category I credits

Emergency Procedures Workshop

Location: Bellevue Hospital Center, New York City

Course Director: Wayne Longmore, M.D., F.A.C.F.P.

Assistant Director: Stanley Tennenbaum, M.D.

Course Description: A one day, two part practical workshop for physicians, nurses and paramedics. Part I: Trauma Center Resuscitation Procedures: cricothyrotomy, chest tube placement, thoracotomy, pacemaker insertion, cut-down, Burr Hole and other emergency procedures. Part II: Minor Surgery Procedures: basic wound care, debridement, suture technique, special procedures "tricks", i.e. removal of fish hooks, foreign bodies, etc.

Dates: On-going program, second and fourth Wednesday of each month. Schedule for 1983: October 12, October 26, November 9, November 23, December 14.

Fee: Resuscitation Workshop: $200; Minor Surgery Workshop: $100.

CME: 8 hours Category I Credit applied for from: ACEP, ACFP, EDNA, NAEMT.

Information: Walter LeStrange, R.N., Education Coordinator, Emergency Care Institute, Bellevue Hospital Center, First Avenue and 27th Street, New York, NY 10016. Telephone (212) 561-6561.

Gamekeeper's Thumb: Examination and Management in the Emergency Department

by Michael L. Guinness, M.D., C.C.F.P., Robert Y. McMurtry, M.D., F.R.C.S.(C)
Robert J. Hill, M.D., F.R.C.S.(C), Michael J. Bell, M.D., F.R.C.S

Abstract

This article first reviews the history, mechanism of injury and anatomy involved in the gamekeeper's thumb. Clinical examination is then followed by radiological studies including stress films and arthrograms of the metacarpophalangeal joint of the thumb. Finally, the Emergency Department management of this injury is presented.

Résumé

Cet article passe tout d'abord en revue l'anamnèse, les mécanismes de blessure et l'anatomie de la rupture du ligament latéral interne de l'articulation métacarpo-phalangienne du pouce (gamekeeper's thumb). L'examen est suive de radiographics comprenant des clichés sous contrainte et des arthrogrammes de l'articulation métacarpo-phalangienne. Enfin, le traitement de cette blessure en salle d'urgence est présenté.

Key Words
- Gamekeeper's thumb
- skier's thumb,
- ulnar collateral ligament of the thumb.

Mots-clés:
- "Gamekeeper's thumb", pouce de skieur
- ligament latéral interne du pouce

Introduction

In the case of the gamekeeper's thumb, there is an injury of varying magnitude to the ulnar aspect of the first metacarpophalangeal joint. Most commonly, the injury occurs when an abducting force is applied at this joint. The term "gamekeeper's thumb" arose in 1955 and was described by Campbell[2]. He noted this as an occupational injury among Scottish gamewardens. Their routine method of killing rabbits involved gripping and stabilizing the rabbit's neck with one hand while exerting a distracting force with the other hand which held the rabbit's head between the thumb and index fingers. This placed an abduction stress repeatedly on the ulnar aspect of the metacarpophalangeal joint of the thumb. The ulnar collateral ligament endured the greatest force of this abduction stress. Because of the repetitive nature of this work, the gamekeeper's thumb is classically regarded as a chronic injury to this ulnar collateral ligament.

In North America, this injury is most commonly seen acutely in those who experience sudden forceful abduction injury to the thumb, often during a fall while gripping a racquet, hockey stick, or ski pole. In fact, "skier's thumb" is a suitable term for this acute injury.

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Anatomy

Figure 1a demonstrates the ulnar collateral ligament with the metacarpophalangeal joint in extension. The joint capsule is also outlined. In this position of extension, the ulnar collateral ligament demonstrates some degree of laxity. Here, abduction and twisting forces are resisted not only by this ligament but also by the adductor pollicis muscle, the accessory collateral ligament attached to the volar plate and by the volar plate itself. With increasing flexion of the joint, however, the burden of support on the ulnar side rests increasingly with the ulnar collateral ligament. Figure 1b demonstrates increasing tension of this ligament when the joint is in flexion. When abduction forces are strong enough, all supporting structures can be damaged, including the ulnar collateral ligament and the joint capsule.

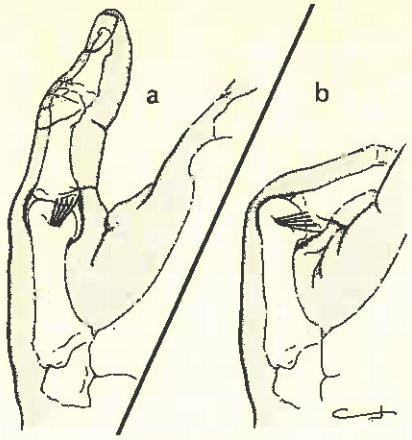

FIGURE 1a
The ulnar collateral ligament and joint capsule of the thumb with the metacarpophalangeal joint in extension

FIGURE 1b
Flexion of the MP joint places the ulnar collateral ligament under increased tension

Examination

After excluding other injuries of the hand and wrist, the examiner may focus his attention on the metacarpophalangeal joint of the thumb.

The patient may present to the Emergency Department at varying periods of time after his injury with a complaint of pain in his thumb. The history of the mechanism of injury is the major initial clue to the presence of a gamekeeper's thumb. The patient may or may not be exactly aware of the area of maximum tenderness. Inspection usually reveals swelling about the ulnar aspect of the joint although the swelling can, of course, be more extensive. Ecchymosis may be present at this site if there has been a delay of more than a few hours between injury and presentation. Palpation may isolate the point of maximum tenderness on the ulnar side of this joint, particularly with a presentation very soon after injury.

FIGURE 2

Methods of immobilizing the metacarpophalangeal joint until consultation is obtained

FIGURE 2a

Thumb spica tape splint for simple sprain. No instability

FIGURE 2b

Scaphoid cast for the unstable joint

At this time, the patient's ability to pinch can be tested. The patient is instructed to pinch the ulnar aspect of his thumb against his opposing fingertips. The power of this pinch is tested by the examiner and comparison is made with the pinch of the uninjured hand. The pinch involves some minor stress or loading of the supporting structures of this joint. Before applying a greater stress, a plain film is required.

Radiological Plain Film

A single x-ray of the thumb and metacarpal should be taken. The discovery of a fracture is by itself an indication for referral to an orthopedic or plastic surgeon. Varying methods of immobilization may be utilized until this consultation can be obtained. These methods include the thumb spica tape splint and the scaphoid cast as shown in Figure 2.

Stress Examinations

With a normal plain film but with the suspicion of instability of the ulnar aspect of the joint, stress examinations are indicated. In some centres, these are performed only by the orthopedic surgeon, but they are easily done in the Emergency Department if time permits.

The stress examination, as in the case of the injured ankle or knee, may be done very briefly without the benefit of local anesthetic. Here, the examination is limited by the patient's ability to tolerate pain. The value of the information obtained from the stress examination is greatly increased by the prior use of local anesthesia. A ring block around the base of the thumb is not sufficient.

Anesthesia of structures about the metacarpophalangeal joint is more neatly and more certainly accomplished using regional blocks of the median nerve and superficial radial nerve as shown in Figure 3.

FIGURE 3

Regional blocks of the median nerve and superficial radial nerve

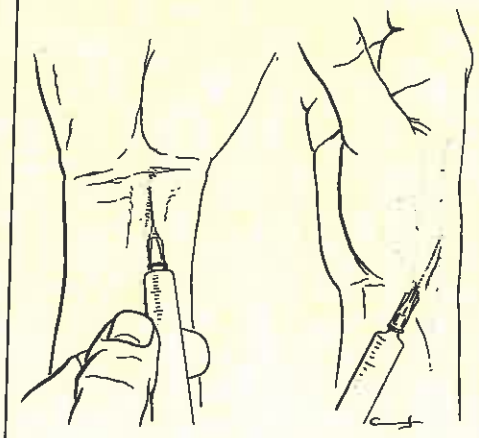

FIGURE 3a

The median nerve is blocked by injecting 5 ml of 1% Lidocaine between the palmaris longus tendon and the flexor carpi radialis tendon. The point of entry should be approximately 2 cm proximal to the distal wrist crease. Depth of insertion is 1 cm. If the palmaris longus is absent, insert the needle 1 cm. to the ulnar side of the flexor carpi radialis tendon.

FIGURE 3b

The dorsal or superficial branch of the radial nerve can be blocked using 3-5 ml of 1% Xylocaine over the dorsoradial aspect of the first metacarpal. Alternatively, the injection can be made on the dorsoradial aspect of the wrist just proximal to the styloid process of the radius.

Stress testing is most informative when the metacarpal is immobilized and when supination of the thumb is prevented. Figure 4 demonstrates the position of the examiner's hands to accomplish this. At this point, abduction stress is applied to the metacarpophalangeal joint. That is, the stress is exerted toward the radial side.

Three positions of the metacarpophalangeal joint can be tested in the stress examination and are shown in Figure 4.

a) full extension
b) 20° flexion
c) full flexion

Positions a) and b) are valuable radiologically and should be compared with stress films of the patient's uninjured thumb. Position c) isolates the ulnar collateral ligament best of all, but its evaluation and comparison are limited to clinical examination. X-rays in position c) are usually cluttered by the overlapping of bones.

Stress radiographs are shown in Figure 5. Instability of the ulnar side of the joint is indicated when radial deviation of the proximal phalanges of the injured thumb is 10° greater than that of the non-injured thumb in either extension of flexion[4]. If the injured joint can be opened more

FIGURE 4

Positions in which stress can be meaningfully applied to the ulnar aspect of the metacarpophalangeal joint

FIGURE 4a

Full extension

FIGURE 4b

20° flexion of the joint

FIGURE 4c

Full flexion

than 35°, particularly when in full flexion, complete rupture of the ulnar collateral ligament can be assumed.

Arthrography for the unstable joint

After stress views have been taken and while the thumb is still under the effect of the regional nerve anesthesia, arthrograms may be easily performed if time permits. The arthrograms are not essential once instability has been demonstrated by stress views, but they can be very effective in delineating the site and extent of tissue disruption about the joint capsule. An uninjured portion of the joint capsule is chosen for the site of the injection. Since most of the injured area involves the ulnar and volar surface, the common site of injection is the dorsoradial aspect, usually between the extensor pollicis brevis and the radial collateral ligament as shown in Figure 6.

FIGURE 5

Stress Radiographs

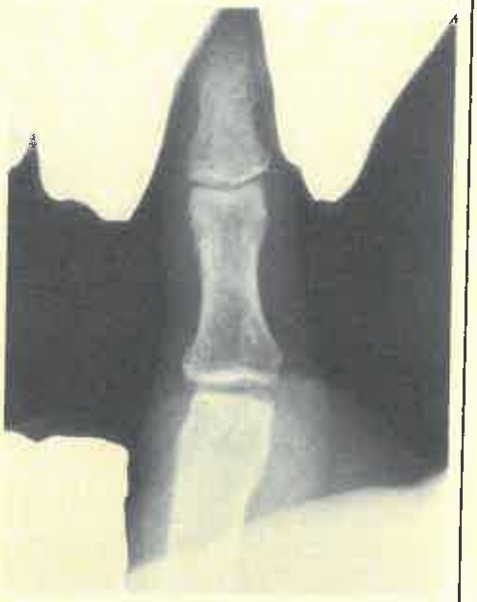

FIGURE 5a

Stress film of a normal thumb. There is very little opening of the MP joint when stress is applied to the ulnar aspect

FIGURE 5b

Opening of the joint under stress. Obvious weakness of ulnar collateral ligament and possibly other structures supporting the ulnar aspect of the MP joint.

Sterile preparation of the metacarpophalangeal area should, of course, be performed. A tuberculin syringe with a 25 gauge needle is used to inject 0.5 ml. of Renografin. Radiological films may now be taken first with the joint in extension but unstressed. This is followed by films with abduction stress applied in extension and then in approximately 20-25° of flexion.

Figure 7 is a line drawing of a normal arthrogram. Figure 8a demonstrates the pathology of the gamekeeper's thumb injury by revealing extracapsular

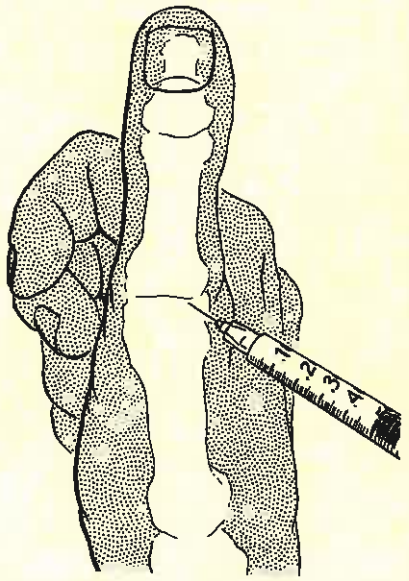

FIGURE 6

Injection of 0.5 ml. of Renografin into the dorsoradial aspect of the MP joint. A tuberculin syringe and 25 gauge needle are used

extravasation of contrast material on the ulnar aspect of the joint in unstressed extension. Figure 8b illustrates the same joint and extravasation when abduction stress is applied against the torn ulnar collateral ligament.

Management

There are controversies in the areas of management of the gamekeeper's thumb. These involve the surgical management versus the conservative management of this injury. However, the emergency physician conducting the *initial* management of the injury need not be concerned by the controversy.

Simple Sprains

When the ulnar aspect of the joint is merely tender and no instability can be

FIGURE 7
Line drawing of a normal arthrogram

demonstrated, the injury has been observed to heal without any specific treatment[4]. However, taping the joint can provide a satisfactory temporary immobilization for a few days before reassessment at the family doctor's office. The thumb spica tape splint shown in Figure 2a is sufficient. Taping

FIGURE 8
Arthrography of an acute gamekeeper's thumb injury

FIGURE 8a
Extracapsular extravasation of contrast in the position of unstressed extension of the MP joint

FIGURE 8b
Arthrogram of the joint in Figure 8a when stress is applied

begins on the volar aspect of the MP joint and the tape is crossed over the ulnar and dorsal aspect. This pathway is repeated with approximately six pieces of overlapping tape.

The Unstable Joint

An unstable joint warrants referral to an orthopedic or plastic surgeon. Since a few days may intervene before this consultation can be obtained, a scaphoid cast is recommended to immobilize the metacarpophalangeal joint (Figure 2b). If moulded splints are available which can immobilize this joint, they would suffice but such splints are rarely kept in Emergency Departments in Canada.

Further Study

There is a study of the injury in progress at Sunnybrook Hospital, University of Toronto. In this study, the stress films and arthrograms are followed by conservative, non-surgical management. A review of cases in the first year reveals encouraging results from conservative management. The full results of the method will be detailed in a future article following the completion of the second year of the study.

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Resident's Corner

Greetings and welcome to all of our new fellow residents as we start a new academic year.

It's going to be an exciting year for all of us with, at last, our formal recognition as a specialty and with the first examinations this fall.

The format of Residents Corner this year will be one of an informative nature for residents and staff alike as well as a forum for us to discuss matters of interest to us all. I welcome your input on any matter pertaining to training of E.R. residents in Canada.

Many things were discussed and planned at our annual meeting in Toronto in June and these were outlined to you in the CAEP Residents Newsletter you all received. (Hopefully!)

Elections were held for CAEP Resident's Committee Chairman, Vice-Chairman and program representatives also in Toronto. I am pleased to announce the following elected positions.

Chairman

Robert Foxford	Montreal

Vice-Chairman

Pauline Head	Calgary

Program Rep's

David Montoya	Toronto
Bob Del Grande	London
Gordon Neil	Calgary
Doug Dersnah	Kingston
Richard Yu	Hamilton
Alain Lamoureux	Ottawa
Robert Foxford	Montreal

These local people may be contacted by anyone interested in any facet of E.R. residency for information or input into CAEP.

We can all recognize the deficiencies of our own programs. Traditionally, areas such as trauma and toxicology for instance have been weak and we have looked elsewhere to gain better expertise in these areas. It was with this problem in mind that the elective bank was first established. A good response to date of interesting electives have been submitted and below is a summary of these. If any of these electives are of interest to a particular resident; he/she may contact the below address for a full description. And more importantly, if you as a resident, have experienced a good elective which may be of interest in one area, or as a staff person, feel you could offer an elective, please submit yours to the below address as well.

1. Neurosurgery at Sunnybrook Hospital, Toronto
   Director: Dr. C. Tator
   Highlights: High Volume via Regional Trauma Unit and Spinal Cord Injury Centre.
2. Canadian Forces Search & Rescue at Canadian Forces Base, Edmonton, Alberta
   Director: Major P. Rossell
   Highlights: Survival Training, Disaster Rescue & Triage
3. Emergency Medicine at St. Paul's Hospital, Vancouver
   Director: Dr. A.P. Scholtz
   Highlights: Advanced paramedic system, high % acutely ill, enthusiastic staff, good skiing!!
4. Paediatric Emergency at Children's Hospital of Eastern Ontario, Ottawa, Ontario
   Director: Dr. Park
   Highlights: Keen staff/interest, high volume
5. Emergency Medicine at Royal Columbian Hospital, New Westminster, B.C.
   Director: Dr. M. Carthy
   Highlights: High volume, high level responsibility given to residents
6. Intensive Care Unit at Kingston General Hospital
   Directors: Drs. Dagnone & Wigle
   Highlights: Lots of procedures, wide patient variety
7. Combined Adult/Paediatric emergency medicine at Foothills, Calgary
   Director: Dr. Rob Abernathy
   Highlights: High volume, tertiary care centre
8. Regional Trauma Unit at Sunnybrook Medical Centre, Toronto
   Director: Dr. Peter Lane
   Highlights: Member of trauma team, research, follow patients through intensive care areas
9. Emergency Medical Services Systems at Calgary
   Director: Dr. D.G. Powell
   Highlights: Involved with EMS research & paramedic training, weekly teaching rounds
10. Trauma – Denver General Hospital, Denver Colorado
    Director: Peter Rosen
    Highlights: Full involvement with trauma resuscitation
11. Orthopedics – York County Hospital, Newmarket, Ontario
    Director: Dr. S.R. Devlin
    Highlights: Large volume, one on one teaching, wide variety of orthopedic problems

Write to:
CAEP Residency Elective Bank
c/o Robert Foxford,
Emergency Department,
Royal Victoria Hospital,
687 Pine Ave. W.
Montreal, Quebec

Well that's all for this issue – see you all again in the winter CAEP Review.

Robert Foxford, M.D.
Chairman, Residents Committee

The Victoria Emergency Medical Service Disaster Site Response

by Peter Beliveau, BSc, MDCM,
Emergency Physician, Victoria, B.C.

Abstract

An outline of The Victoria Medical Services Disaster Site Response is presented and illustrated by its use in a recently run mock disaster. A critique is performed of The Disaster Plan Command Structure, organizational structure and function, communications, and removal of casualties from the staging area.

Résumé

Cet article présente un aperçu du plan de désastre du Victoria Medical Services suite à une simulation récente. On évalue les structures de commande, l'organisation et le fonctionnement du plan de désastre, le système de communications, ainsi que l'évacuation des blessés à partir du site de triage.

Key words:
- Disaster Planning
- Mock Disaster

Introduction

Various organized medical responses to disasters have been proposed, and each response attempts to address the problem of matching the medical resources with the quantity and type of casualties most likely to be produced. R.V. Gerace[1] outlined an approach in which medical response teams from the hospitals and an external triage from the community would respond to the site of a disaster. The use of a graduated response relying heavily on Emergency Medical Technicians initially and, if necessary, Emergency Room Physicians and Emergency Room Nurses for assistance in triage has also been advocated[2]. Certain specific events in clearly defined areas present problems which require a unique solution. Star et al[3] describe the concept of transporting the hospital to the disaster site rather than transporting unstable casualties. They utilize previously equipped Emergency Hospitals located at the airport. In the event of a disaster, trained trauma teams from predetermined hospitals are transported to the site to staff these facilities, stabilize patients, and then evacuate the stabilized patients to appropriate hospitals in an organized and orderly fashion. In Cincinnati, Volunteer Medical Assistance Teams have been organized and are available in the community to respond to a disaster. These teams provide critical care at the scene of a disaster and respond to the disaster without impairing the level of care normally available in the community hospitals. The hospitals that are awaiting incoming casualties are therefore maintained at full staff[4].

The word "disaster" has different meanings, dependent on the individual viewing the event. In this paper, "Disaster" is defined as: An event in which the number of casualties greatly exceeds the supplies, equipment, trained medical personnel, and physical facilities generally available to adequately deal with the victims.

Each area or community is unique with respect to the types of multiple casualty events that are likely to take place. They also differ as to the number and qualifications of persons trained to preserve life, and the resources they may have available to counter the event. Each agency that is responsible for a role in meeting the demands of a disaster, views the event from a different perspective and with a different level of urgency. Adequate communication and planning are necessary between all the involved agencies in order that a comprehensive plan can be enacted to ensure the appropriate control of the initiating event and care of casualties that are produced.

Vancouver Island is geographically isolated from the rest of British Columbia by water, therefore blunting any immediate disaster support from the mainland. Thus any disaster must be managed by the resources on hand. The southern end of the island has the majority of the population of Vancouver Island and more than a quarter of a million people are centered in and about the city of Victoria. The acute care hospitals that are available to receive casualties are the Royal Jubilee Hospital, the Victoria General Hospital, and the Saanich Peninsula Hospital. The Royal Jubilee (551 acute care beds) is the designated tertiary care hospital on Vancouver Island. The Victoria General Hospital is a community hospital with 394 acute care beds. The Saanich Peninsula Hospital is a small community hospital of 75 beds. Only the two large hospitals have intern coverage, as well as one full time Emergency Physician present in the Emergency Department twenty-four hours a day.

Victoria is fortunate to have a well trained Provincial Ambulance Service. The ambulance technicians are generally certified to one of two levels. EMA II's are attendants trained in basic cardiopulmonary resuscitation, extrication, stabilization of fractures and patient transport. EMA III's operate two advanced Cardiac Life Support ambulances on a twenty-four basis. These crews are additionally trained and experienced in trauma as well as Advanced Cardiac Life Support methods. The environs of Victoria are the responsibility of volunteer ambulance attendants and they generally operate from volunteer fire stations.

With the knowledge that any disaster response would be limited to resources at hand and that the available hospital house staff at any given time was limited,

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an Emergency Health Services disaster plan was formulated with the co-operation of the Provincial Ambulance Service, the three hospitals involved, and the Emergency Physicians.

The two main themes that predominate in developing the plan were the use of available personnel at the time of the disaster and the limitation of hospital on-site involvement. The organizational structure at the disaster site would be clearly outlined in the plan and the available personnel most qualified at the scene would fill the roles to develop that command structure. The plan was to be clearly and concisely written in a small booklet to be carried by each ambulance, and its contents to be known by each attendant. Because of the desire not to compromise a hospital's capability of responding to the demands of multiple incoming casualties, a limited medical response team would be sent to the scene if requested by the Provincial Ambulance Service. This team could be augmented as necessary by available community Emergency Room Physicians. Triage and stabilization at the site would depend heavily on the Paramedic crews available. The plan to be outlined is only the on-site Emergency Medical Services component of an over-all disaster plan being developed by the Capital Regional District. The response is designed to deal with multi-casualty events in a relatively confined area, however it is flexible enough that a larger area could be dealt with if necessary. The ambulance dispatch center would be alerted of a disaster or impending disaster situation and dispatch appropriate ambulance crews to the site.

An attempt will be made to outline the Victoria Emergency Medical Services disaster site response which has evolved over the years to meet the specific needs of this area. The command, organizational structure and patient flow will be illustrated by the use of the plan in a recently performed mock disaster. The following critique of the exercise will allow evaluation of the effectiveness of the response. It is hoped however, that it will become apparent, that although each region has it's own specific difficulties, there are a number of important common problems that have to be addressed by any plan before it will allow the individuals to perform their roles effectively and in a co-ordinated manner.

Capital Regional District Emergency Health Services On-Site Disaster Plan:

COMMAND: a fixed highly visible and accessible command center is to be established at the disaster scene. The personnel responsible for co-ordinating the activities of their respective Emergency Services must be stationed there with one individual designated as the on-site commander. The command center serves as the headquarters for all command, communications, and co-ordination of the on-site activity. It is through this center that the individual emergency service communication networks have a common link and it is the responsibility of the on-site commander to match the resources of the agencies with the needs of the disaster situation.

In the case of the ambulance service, the crew of the first responding car will be the ambulance co-ordinating team and the attendants will assume the roles of "ambulance co-ordinator" and "ambulance communications officer". The former co-ordinates the medical response to the disaster situation and has total authority in making decisions involving Emergency Health Services Personnel on the scene. He ensures that a rapid evaluation of the number of victims is performed and the severity of their injuries is known to enable an adequate ambulance response. It is his decision to request the triage team from the Royal Jubilee Hospital. The triage team is initially composed of one Emergency Physician, an Intern, two Emergency Room Nurses, and a member from Medical Records. They are transported by the ambulance service and carry a supply of narcotics as well as medical triage kits in paramedic type cases.

The ambulance co-ordinator must assess the accessibility of the site and the needs for transportation. If difficulties in extrication are envisioned, then further medical supplies and advanced medical support may be required. He must define the geographical areas (see Fig. 1) of triage, Priority I, II, and III holding areas, morgue, staging area, and evacuation point. Assigning the most qualified personnel available to command these areas and organize their functioning are also the priority tasks of the ambulance co-ordinator. Obviously as more senior or qualified people arrive these roles can be relinquished to them if necessary.

The ambulance communications officer maintains a communications link between the on-site medical personnel, command center, ambulance dispatch, and the hospitals. All medical personnel that have accepted command of specific areas are clearly identified by a florescent orange vest with the command position clearly labelled on the vest. These vests are worn over all outer clothing and thus easily identify the individual to other agencies.

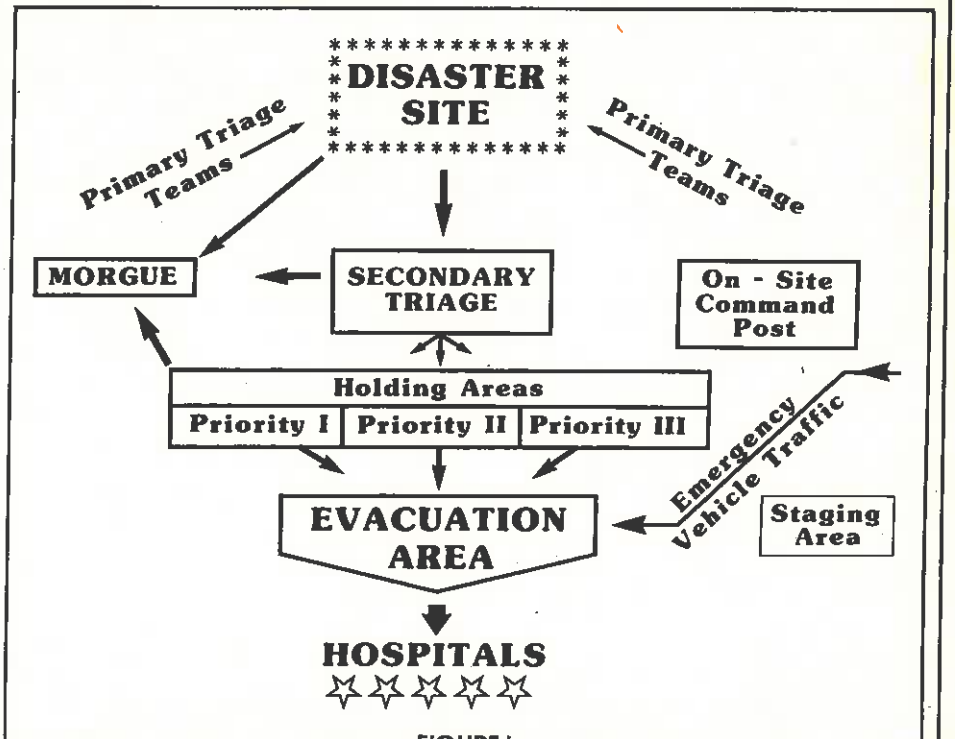

FIGURE I

TRIAGE: If the number of casualties is great, difficulties in extrication are expected, or delays in transportation are envisioned, then the triage is to be performed in two stages, i.e. Primary and Secondary triage.

Each ambulance vehicle is equipped with precut lengths of colored surveyors' tape on a clip which can be readily attached to the attendant's belt. The tape is easily tied to a limb to primarily priorize a patient, i.e. Red for urgent, Yellow for delayed, Green for minor and Blue or Black for dead casualties. Extrication teams are formed. These are commanded by an ambulance attendant (EMA II or III) who is the primary triage officer. The remainder of the team may be composed of a fireman, stretcher bearers, "first aiders" and a runner. As the teams systematically triage the casualties, the victims are extricated and transported to the secondary triage site in order of priority which has been clearly indicated by affixing the colored length of surveyors' tape to the casualty by the primary triage officer.

The secondary triage site is under the command of the secondary triage officer. This position is taken by the Emergency Physician if the hospital disaster team has arrived or by an EMA III. The number of secondary triage personnel will be dictated by need and available personnel. The Medical Emergency Triage Tags (METTAG) (Fig. 2) are then utilized to secondarily categorize a patient. A color at the bottom of the tag indicates priority and each colored strip can be torn off along a perforated line with the bottom most color designating the category.

Priority I (urgent) – Red
Priority II (semi-urgent) – Yellow
Priority III (minor surgery) – Green
Dead (or unsalvagable) – Black

There is also a place on the tag for casualty demographic information as well as medical information such as extent of injuries and medication given.

TREATMENT: From extrication to secondary triage, only the basic "ABC's" of cardio-pulmonary resuscitation have been addressed. The casualty holding areas that have been geographically defined and clearly marked are organized under the officer in charge (i.e. Priority I Officer). This position is usually filled by either an Intern, Emergency Physician, or an EMA III. Dressing applications, splinting, drug administration, intravenous infusions, and cardio-pulmonary stabilization occur in these areas before evacuation. If transportation time is prolonged, then these functions become manditory if patient morbidity and mortality are to be minimized. The other patient holding areas are similarly organized and staffed. Constant re-evaluation of these patients is necessary to maintain stabilization and priority. The holding areas are clearly geographically defined by appropriately colored surveyors' tape held by tripods.

MORGUE: Following the triage of all living patients the secondary triage officer pronounces and tags all dead victims that have been moved to the on-site morgue and then performs the same duties for those dead victims still left in or near the disaster scene. Ideally all disaster victims should have been tagged and an accurate casualty count obtained. The coroner is in charge of the morgue and the dead casualties at the disaster site.

TRANSPORTATION: Evacuation is under the control of the Evacuation Officer who is responsible for ensuring that patients are evacuated from the disaster site according to their categorization in an orderly and efficacious manner. An Ambulance Supervisor usually performs the task since his expertise in patient loading and communications are vital. If a dispute arises over the priority of the patient, the Priority I Officer has the ultimate authority on the priority of the casualty. The Evacuation Officer is in contact with the hospitals through the ambulance communications officer and can thus direct patients and ambulances to the appropriate hospitals. He keeps an accurate log of all patients that are evacuated from the disaster site, the level of priority, and their destination.

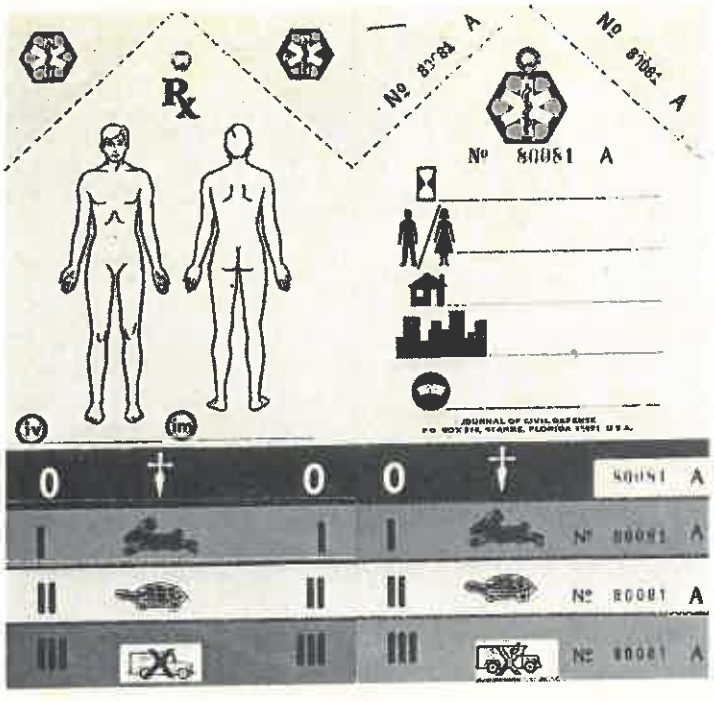

FIGURE II

Air/Sea/Land Disaster Exercise

"A scheduled medium-sized airliner has made a crash landing on Patricia Bay at 15:13 PST. The airliner appears to be floating one mile west from shore by the buoys south of Warrior Point. The Captain advised there are approximately 80 persons on board, some are seriously injured requiring medical attention. Water Rescue is required". This terse message from the Victoria International Airport Control Tower to the Rescue Co-ordination Centre at C.F.B. Esquimalt commenced the joint "Disaster Exercise Pegasus", of Transport Canada and the Provincial Emergency Program.

"Pegasus" involved approximately 200 individuals from twenty-three groups and agencies. Disaster Victim simulations were performed on seventy Senior Secondary School Students. Twenty-eight "casualties" were onboard a Twin Otter aircraft floating on Patricia Bay, approximately 30 kilometers north of Victoria. Twenty-five victims were floating in the water in wet suits, and the rest were strewn on an adjacent beach. The object of the exercise was to

evaluate the disaster plans of each of the emergency services involved in such an event and attempt to co-ordinate their plans.

"Exercise Pegasus" commenced at 15:13 hours with the previously mentioned message. Two rescue boats had lifted the last bodies from the water within twenty-seven minutes and three further sea rescue boats from the Provincial Emergency Program had extricated victims from the aircraft within fifty-four minutes of the crash. These casualties were taken to a nearby dock facility which was chosen as the staging area for triage and evacuation of casualties. RCMP, Provincial Ambulance Personnel, and the Airport Fire Chief co-ordinated the rescue efforts from the casualty collection area, with an RCMP Officer as the On-Scene Commander. The first ambulance to respond organized the medical command structure and clearly defined and marked the appropriate areas. The Royal Jubilee disaster response team was transported to the scene immediately by an ambulance supervisor following the request of the ambulance co-ordinator. The team arrived within thirty minutes of the disaster exercise commencement and established control of the secondary triage site. Senior ambulance supervisory personnel arrived to take control of the ambulance co-ordination and communication positions as well as the evacuation site. The casualties arriving by rescue boat were primarily triaged at the dock, with the surveyors' tape, by teams of EMA II's. They were then borne by stretchers to the Secondary triage area in order of priority. The Secondary triage was performed by two teams, each consisting of a Doctor and an Emergency Room Nurse. First priority patients were immediately loaded into waiting ambulances. The second priority casualties and walking wounded were triaged into the predetermined holding areas and constantly re-evaluated and "stabilized" by ambulance attendants and St. John's Ambulance personnel. As space became available in the ambulances, the "casualties" were transported to the hospital. The victims located on an adjacent beach were transported directly to the secondary triage station and then triaged appropriately. On-site communication was maintained by hand-held radios with a volunteer assigned to the secondary triage officer.

Exercise Critique

(1) On-Site Command – The Command Post, in fact, was never established. The emergency service co-ordinators tended to walk about the triage site making communication only possible by radio. This limited both the co-ordination of agencies and the flexibility of the individual disaster plans to meet the needs of the disaster. This flaw could easily be rectified by the conversion of an ambulance into a clearly marked Mobile Command Post to be used for disasters. The vehicle would have all the necessary disaster equipment, medical supplies, and communication equipment. The co-ordinators would have to remain in this vehicle. This would then enable the hospitals to have direct radio communication with all of the co-ordinators and this vehicle would serve as the vital link between agencies. The exercise illustrated that when each agency was occupied within their area of concern, the site evacuation went smoothly, however, when areas of responsibilities over-lapped, then conflicts developed. It is apparent that when command becomes distributed and a defined individual cannot be apprehended to settle areas of conflict, or have the authority to issue resources to one agency from those held by another, organization is eroded and the co-ordination that is so necessary ceases to exist.

(2) Triage – The distances involved in moving patients from the crash site to the dock and then to a dry and clear area for ambulance departure required accurate and rapid primary triage. Lack of extrication equipment in the rescue boats would have proven disastrous in a real disaster. Ideally primary triage should have occured from the rescue boats but lack of co-ordination between agencies did not allow this to occur.

Secondary triage was an advantage because of the limited number of transport vehicles, the distances to the hospitals, and the large number of casualties. The survivors on the adjacent beach created a problem which was not dealt with adequately. A paramedic triage team should have been dispatched to the beach to tag and then transport the casualties directly to the hospitals by available means.

The surveyors' tape was an extremely rapid and highly visible means of making priorities. Even with the patients lying on stretchers, the flags could be easily visualized. The surveyors tape proved so useful and inexpensive that its value at a mini-disaster becomes apparent. At a crash scene with ten or so casualties, there quite often is valuable time lost when the same individual is inadvertantly triaged by two or three ambulance attendants in succession. If the first attendants on the scene tag the patients, then more time can be given to extrication, stabilization, and subsequent transport as further crews arrive and see the surveyors' tape. The METTAG's proved durable, were easily attached, and carried identification numbers which could then be traced from site departure to hospital triage. The drug information and wound description areas of the tags became very useful in the walking wounded and second priority stabilization areas since these individuals tended to remain on the site longer and documentation became more involved. The two main disadvantages to the tags, were the visibility of the priority on the tag and the difficulty in down-grading the priority. The tags tended to bend and therefore mask the priority status until the tag was grasped and straightened to its full length. It is impossible to down-grade a status without replacing the tags and thus losing all the information on the initial tag. This became apparent in the holding areas where re-evaluations changed priorities in some casualties.

(3) The Communication – Communication is an extremely important aspect and is always the largest hurdle in a co-ordinated disaster plan. Multiple hand held radios on one frequency creates chaos. It seems imperative to have one frequency for each of the major agencies co-ordinating the disaster from the on-site Command Post. This diminishes the counter productive interference found with one frequency and allows the Command Post to function in a co-ordinated manner. At this exercise however, multiple frequencies were used, but the absence of the common link via the on-site Command Post deteriorated the co-ordination of the disaster site. Volunteer radio operators did not prove as useful as expected with the on-site communication. Although they proved expert at utilizing the equipment, their lack of knowledge of agency specific jargon and disaster plans, diminished the advantages of their expertise with the radios. It seems advisable that each agency should have their own equipment and frequency as well as become knowledgeable in its utilization by participating in such exercises.

A bull horn, to be kept at the ambulance loading area, would allow adequate communication with stretcher teams advancing on the triage areas and to contact individuals, both casualties and rescuers, when it became necessary.

(4) Visual Identification – The rapid visual identification of a colleague in a crowd of people is a necessity. Helmets tend to be too clumsy and they fall off frequently. They are bulky to store and any lettering is too small to read at a distance especially at night. Florescent orange triage vests were used with florescent lettering front and back. They were highly visible at a distance, especially in poorly lit areas. Velcro fastener made them comfortable and adjustable. The leader of each triage team and stabilization area, as well as the evacuation officer, could then be easily identified and the area to which he was attached became more obvious to the uninitiated members of other agencies.

(5) Removal of casualties from the Staging Area – The leader of the first priority stabilization area has the ultimate authority for priority removal of patients from the evacuation point. It became apparent that ambulances were waiting to fill completely with first priority patients. If this delay becomes significant relative to the transport time to the hospital, then it would appear to be prudent to load as many first priority casualties as available and then fill the remaining ambulance stretcher space with second priority or walking wounded that may be waiting. The evacuation of the site would progress more efficiently and therefore the overall survival would improve.

(6) Disaster Site Size – One quite often conceptually visualizes a disaster site in a relatively confined space as might occur with a bus or plane crash. With the advent of large convention centers, city riots, or, in the event of a natural disaster, the disaster site becomes a larger, less clearly defined area. The Victoria disaster plan has to be modified to allow mobile triage teams and transport vehicles to be placed at strategic areas to perform primary triage and transport. The division of casualties to appropriate hospitals becomes much more difficult to control and the walking wounded tend to ignore the triage areas and go directly to the nearest hospital, thus blunting the hospitals' ability to accept more seriously injured patients. This lack of secured control of a disaster site threatens the organization of any disaster plan but points to the need for an on-site command post with radio communication to its dispersed elements to bring as much structure and co-ordination of efforts as possible in this obviously chaotic situation.

Summary

Individuals tend to react to a disaster situation by doing emergency tasks that they perceive as most critical and these tasks are usually dependent on the individuals' background and training. This random action will occur until such time as a disaster plan can be put into operation and overall control developed and tasks delegated. It is then apparent that individuals perform best when given tasks that they normally do, but now perform in an organized and co-ordinated environment at a different level of activity. The individual has to "shift modes" from the usual level of functioning to that level which is necessary to use during major disasters. The usual "treat as you come to them" attitude must be shifted to the mode of "priority".

Immediately following a disaster, chaos ensues until a plan can be brought into effect that will permit a system of command, authority, responsibility, and organizational structure adequate to co-ordinate the activity of the individual emergency agencies, each performing in their normal areas of expertise. The overall on-site command must be in one individual's hands. Either the Fire Chief or the Senior Police Officer is an appropriate choice. He must not interfere with the command of other agencies. He must utilize the information and expertise that the other agency commanders have, to co-ordinate the work of the other services to maximize the utilization of resources and to minimize destruction and mortality. The Command Post must be in a secured location, highly visible and recognizable by all, and fixed in position so that all agency commanders are in intimate contact amongst themselves and in radio contact with their personnel and resources.

A disaster plan must address the expected source of a disaster and match the resources available to counter the situation. The plan must be simple and known by all individuals that may be called upon to perform. It must be flexible enough to meet changing situations. It must also be designed to be implemented by available personnel and not require the key individuals who developed the protocol to be present to orchestrate the plan. The overall disaster plan must be known to each agency so that each knows the goals of the other, thus avoiding unnecessary duplication of service and unfulfilled assumptions.

TABLE I

Summary of Issues of Concern in all Disaster Responses

Complexity
The plan should be simple enough to write down on a few pages but detailed enough to answer issues of responsibility and authority. The plan should be simple enough to be flexible.

Command Structure
One on-site commander who co-ordinates the activities of all the emergency agencies. He must be in intimate contact with the leaders of individual on-site agencies. He must relinquish command of the agency to which he belongs.

Organizational Structure
Each individual performs the tasks that he has been trained to perform. Structure evolves from personnel on hand and not preassigned.

Health Services Response
Co-ordination of all the health services response should be under the control of one individual.

Triage
As simple as situation and resources allows. Secondary triage could occur at a centralized hospital if facilities and means of transportation were readily.

Communication
Each agency should have their own communication system with common link only at the on-site command center.

Identification
Easy visual recognition of key officers and areas.

Identification of each agency is imperative in a crowded disaster site. Special uniforms or clothing such as vests clearly marked front and back with full lettering are required.

The means of communication, the frequencies used, and the expertise to use the equipment must be in place prior to the disaster. Funding at present seems to make this aspect the "achilles heel" of most disaster plans.

The Emergency Physician's role at a disaster site should be limited by his training and knowledge of resources available. Unless he possesses an intimate knowledge of communication networks and medical resources available in his area, he should limit his on-site responsibilities to the area where his expertise is best utilized, i.e. triaging and stabilization of patients. Emergency Physicians need to take themselves from the "Room" of the hospital setting and hospital disaster plans and attempt to co-ordinate these institutional plans with the rest of the Health Care System in their area. The final and most complicated step is the evolution of a common plan with the communities and their agencies in the region. Only after completion of this last step can it be hoped that a disaster can be met with anything other than partially organized chaos, with each emergency service doing their best to do the task they feel is most appropriate.

Acknowledgements:
The development of the Victoria Ambulance Disaster Plan was chiefly through the dedicated efforts of Michael Riseborough and the implementation of the plan was through the persistant work of Bill Gedye of the Provincial Ambulance Service.

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TABLE II

Disaster Plan Organizational Structure

On-Site Commander
Has the authority of co-ordinating all emergency response agencies on-site.

On-Site Command Post
Composed of respresentatives from each emergency response agency.

Ambulance Co-ordinator
First attendant on-site. Responsible for establishing organizational structure and co-ordinating health services response.

Ambulance Communications Officer
Second attendant on-site. Establishes communication link between command post, Health Services Personnel on-site, and the Hospitals.

Primary Triage Officer
Has command of triage team which primarily triages victims and removes them from the site to a secured secondary triage area.

Secondary Triage Officer
Has command of the secondary triage area. Triages patients to the priority holding areas.

Priority Area Officer
Has command of the Priority holding area to which he is assigned. Responsible for stabilization and reassessment of patients in his area. Priority I officer has ultimate authority on priority of patient evacuation.

Evacuation Officer
Responsible for the evacuation of casualties from the disaster site. He maintains contact with the communications officer to direct patients to the appropriate hospitals.

Motion Passed

CAEP Business Meeting
June 29, 1983

WHEREAS the proliferation of nuclear weapons continues unabated, thereby increasing the possibility of nuclear war by design or accident; and

WHEREAS a nuclear war would be a catastrophe with medical consequences of enormous magnitude and duration for all humanity not the least of which would be

- the immediate death of millions from blast, thermal and radiation injuries, with
- many of the remaining survivors suffering from multiple injuries and deprived of any effective care, as well as
- endangering all surviving generations and their environment for an indefinite time period; and

WHEREAS the Nuclear Arms Race is consuming precious resources which could be used in providing essential health services;

BE IT THEREFORE RESOLVED that The Canadian Association of Emergency Physicians strongly believes that the only rational response to this unprecedented threat to public health is prevention, and therefore undertakes to educate its members and the public at large of the medical consequences of nuclear war; that CAEP express its concern to The Canadian Medical Association; that CAEP encourage as a high priority the strategy of suffocation proposed by The Prime Minister of Canada in 1978 including:

1) a comprehensive test ban treaty,
2) an international agreement to limit and progressively reduce military expenditures on nuclear weapons systems,
3) a ban on flight testing of all new strategic delivery vehicles and
4) a ban on the production of fissionable materials for nuclear weapons purposes.

Cardiac Contusions; A Post-mortem Review

by Linda O'Connor, Peter L. Lane, M.D. and R.Y. McMurtry, M.D.

Abstract

A retrospective study was undertaken to attempt to more clearly delineate the presenting features and clinical course of cardiac contusion. The hospital records and post mortem reports for eighteen patients, were reviewed; 17/18 patients had suffered vehicular trauma, and all had some other associated chest injuries – 78% with pulmonary contusion, 67% with rib fractures. Cardiac contusion was confirmed on all patients by post mortem examination. 13/18 patients had left ventricular contusion only. It is suggested that the diagnosis should be suspected in all patients with signs of blunt chest trauma who fail to respond to adequate fluid volumes and demonstrate high filling pressures. More sophisticated diagnostic modalities are discussed.

Résumé

Une enquête rétrospective fut effectuée dans le but de déterminer plus clairement les signes d'appel et l'évolution de la contusion cardiaque. Les dossiers et les rapports d'autopsie de 18 patients furent révisés: 17 patients sur 18 avaient été victimes d'accidents de la circulation et tous présentaient des blessures thoraciques – 78% souffraient de contusion pulmonaire et 67% de fractures de côtes. L'autopsie a confirmé la présence d'une contusion cardiaque chez tous les malades. Treize malades étaient atteints d'une contusion ventriculaire gauche seulement. Il est conseillé d'évoquer le diagnostic chez tous les patients montrant des signes de traumatisme thoracique fermé qui ne réagissent pas à un volume de remplacement liquidien adéquat et dont la pression de remplissage est élevée. Des démarches diagnostiques plus poussées sont également présentées.

Key Words:
- cardiac contusion
- cardiac trauma
- blunt chest trauma

Mots-clés:
- contusion cardiaque
- traumatisme cardiaque
- traumatisme thoracique fermé.

Introduction

Cardiac contusion is a serious and potentially fatal sequela of blunt chest trauma; yet its clinical presentation is subtle and poorly defined. The incidence of cardiac contusion among victims of blunt chest trauma also remains unclear, varying widely in series from 17%-76%, depending on diagnostic criteria and the thoroughness of investigation. Various authors discuss the sensitivity and specificity of diagnostic modalities – EKG abnormalities, elevated enzyme levels, isotope scans and echocardiography. No clear "gold standard" for diagnosis currently exists, so conclusions regarding diagnosis and management are tentative at best.

The best "gold standard" of diagnosis remains the pathologist's report. As a result, a post-mortem review was undertaken to attempt to define more clearly the presenting features and clinical course of patients with cardiac contusion.

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Materials and Methods

Since commencing operation in June 1976, the Regional Trauma Unit (RTU) at Sunnybrook Medical Centre in Toronto has collected data prospectively on all admissions (Injury Severity Score[1] > 15). In addition to collecting a great deal of data regarding costs of care, diagnostic and therapeutic procedures and clinical course, RTU staff assign each patient an Injury Severity Score (ISS)[1]. The ISS is revised, if necessary, in light of post-mortem findings. Both initial scoring as well as subsequent revisions are done by one person, to ensure consistency.

The entry criterion for the study was the post-mortem documentation of cardiac contusion. Initially, the RTU Death File was reviewed. All patients with evidence of blunt chest trauma were identified. The post-mortem reports of these patients were then reviewed, and the group of patients with the pathological findings of cardiac contusion was identified. A retrospective chart review of these patients was then undertaken. Data abstracted included the age, sex and ISS of the patients, injuries sustained, and details of initial presentation, investigation, clinical course and cause of death (Table 1).

TABLE I

Age
ISS
Mechanism of Injury
Other Chest Injuries
Other Associated Injuries
CVP/PAWP
EKG Abnormalities
Enzyme Studies
Other Investigations
Cause of Death
Post-Mortem Findings

Results

During the study period, 6/76-4/83 over 1400 patients were admitted to the RTU. Of the 220 patients who died, 94 were identified with evidence of blunt chest trauma (fractured ribs or sternum, hemothorax, pneumothorax, flail chest, pulmonary contusion or cardiac contusion, ruptured thoracic aorta, pericardial tamponade).

Of these 94, 69 had autopsies performed. 18 of the 69 showed post-mortem evidence of cardiac contusion. The evidence of cardiac contusion among trauma deaths with evidence of blunt chest trauma can therefore be estimated as 18/69 or 26.1%.

The ages of these 18 patients ranged from 16 to 100, with a mean of thirty-eight. 17/18 patients sustained their injuries in a motor vehicle accident, while the other was mauled by a bear.

ISS's for these cases ranged from 24 to 75 with a mean of 51. Bull[2] has developed the concept of LD_{50} – the ISS at which 50% of patients in an age category will die. 10/12 of the cardiac contusion patients under 45 had scores above their LD_{50} of 40, all 4 of those 45-65 exceeded their LD_{50} of 29, and both of those over 65 exceeded their LD_{50} of 20.

Initial Presentation

All 18 patients had other evidence of blunt chest trauma, with the most common injuries being pulmonary contusion (78%) and rib fractures (67%) (see Table II).

Non-thoracic associated injuries were again varied, with the most common regions being extremities and bony pelvis (89%) and head and face (67%) (Table III).

Of the 18 patients, 5 had had internal cardiac massage performed at some point during their course. Although unlikely, the massage itself could conceivably have contributed to the pathological findings of contusion.

TABLE II

Associated Chest Injuries (n=18)		
Pulmonary Contusion	14	(78%)
Bilateral	11	(61%)
Fractured Rib(s) Total	12	(67%)
Left	10	(56%)
Right	9	(50%)
Bilateral	7	(39%)
Hemothorax	8	(44%)
Pneumothorax	5	(28%)
Fractured sternum	3	(17%)
Flail chest	3	(17%)
Vascular injury	2	(11%)

TABLE III

Other Associated Injuries			
Head and Face	Total	12	(67%)
	Cerebral contusion	6	(33%)
	Brain stem injury	4	(22%)
	Subdural hemorrhage	2	(11%)
	Subarachnoid hemorrhage	1	(5%)
	Skull fracture	4	(22%)
	Facial fractures	3	(16%)
Neck and Throat	Cervical spine fracture	1	(5%)
Injuries to	Total	8	(44%)
Abdominal or Pelvic Contents	Liver	7	(39%)
	Spleen	3	(16%)
	Urinary bladder	3	(16%)
	Vascular	2	(11%)
Injuries to extremities	Total	16	(89%)
and Bony Pelvis	Pelvic fractures	9	(50%)
	Extremity fracture	13	(72%)
	Clavicular fracture	4	(22%)
	Spinal fracture	2	(11%)
External Injuries	Total	8	(44%)
(lacerations, burns)	Scalp	2	(11%)
	Facial	6	(33%)
	Torso	1	(5%)
	Limb	3	(16%)

Therefore, these 5 patients were excluded from further analysis. The remaining 13 patients were further divided into 3 who died within the first 6 hours, 2 who survived 6-24 hours, and 8 who lived longer than 24 hours.

Central filling pressures were evaluated. Both CVP (central venous pressure) and PAWP (pulmonary artery wedge pressure) were examined. However, with all patients in the group, if CVP was normal, so was PAWP, and if one was elevated, so was the other. Central filling pressures were not recorded for 3 of the 13 patients, two of those were early deaths (< 6 hours) while the other survived > 24 hours. Of these 10 patients, 8 showed elevated values for CVP and PAWP.

Investigations

A variety of diagnostic techniques were employed. 7/13 had comprehensive EKG records available on the chart. All of these were from the group surviving > 24 hours. All seven of these patients developed EKG abnormalities consisting of ventricular dysrhythmias, ST-T changes, and/or non-specific repolarization changes.

Blood enzyme data (CPK, MB Isoenzyme, LDH, AST) were available on six patients, all of whom survived > 24 hours. Enzyme levels were elevated in all six patients.

Isotope scanning was not performed on any of the 13 patients studied. However, one patient did have both cardiac catheterization and an echocardiogram performed, both of which were grossly abnormal, showing hypokinesis and an ejection fraction of 30%.

Post-Mortem Findings

Table IV shows the cause of death as stated on the post-mortem report. Most pathologists listed more than one cause. Only one listed cardiac contusion.

Of the initial total of 18 patients, there were 13 with only left ventricular subendocardial hemorrhage, 1/18 with right ventricular mural thrombi, 1/18 with bruising to the right atrial appendage, 1/18 with "epicardial hemorrhage" and two with "myocardial contusion".

Discussion

Cardiac contusion is defined as subendocardial, intramyocardial or subepicardial hemorrhage, and can vary from small petechiae to large bruised areas of the heart.[3] Its functional significance can vary from none to large areas of hypokinesis with severely reduced cardiac output. It can also give rise to serious dysrhythmias. It is distinguished from cardiac concussion, defined as the occurrence of an arrhythmia following blunt trauma without enzyme, EKG or pathological changes.[4,5]

Cardiac contusion was first described by Borch[6], but clear clinical diagnostic criteria have yet to be developed. Until quite recently, EKG changes were the principal means of diagnosis.[7,8,9,10] EKG changes observed vary from sinus

TABLE IV

	Cause of Death		
Head Injury	Hypoxic-ischemic encephalopathy	5	(28%)
	Brain Injury	4	(22%)
	Subdural hemorrhage	1	(5%)
	Fractured skull	1	(5%)
Thoracic Injury	Lung contusion	4	(22%)
	Bronchopneumonia	3	(16%)
	Cardiac contusion	1	(5%)
	Transected aorta	1	(5%)
Abdominal/ Pelvic Injury	Liver injury	3	(16%)
	Kidney failure	1	(5%)
	Pelvic fracture	1	(5%)
Multiple Injuries Due to Generalized Blunt Force		9	(50%)

These categories are not exclusive; 11 patients died of more than cause.

tachycardia[8], non-specific ST-T changes[10] to conduction abnormalities.[9,10] Several authors have commented on the EKG and clinical similarities between an evolving infarct and an "evolving" contusion.[7,11]

However, many authors question the specificity of the EKG changes.[12,13,14,15] Dolara et al[16] showed that fully 63% of patients with blunt chest trauma had EKG changes. More recently, Symbas[3] and Snow et al[17] have again concluded that, despite its lack of specificity, serial 12-lead EKG's are the most sensitive and practical means to identify patients at risk.

In the present study, all patients with documented contusion on whom EKG data were available showed abnormalities. These abnormalities however were non-specific and hence suggestive rather than diagnostic.

Several authors make the rather intuitive statement that because the right ventricle lies anteriorly in the chest just beneath the sternum, it is more susceptible to contusion. Wade[18] and others have pointed out that EKG diagnosis of right ventricular injury is non-specific because the large muscle mass of the left ventricle overshadows the small injury current of the right ventricle. It can be postulated that EKG evidence was found in all patients studied herein because of the predominance of left ventricular injury.

While the advent of fractionated determinations of serum CPK has greatly simplified the diagnosis of acute myocardial infraction, the same cannot be said for contusion. Linsey et al[20] suggested that CPK – MB measured early after injury could offer evidence of cardiac injury. However, many others,[7,10,13,15,17,20] argue that the isoenzyme is too non-specific as it may arise from liver, lung, brain or skeletal muscle. Other enzymes – LDH, AST – are even less specific. Hence, the findings of elevated enzyme levels in all patients studied here again is not surprising.

Technetium pyrophosphate scanning has been advocated by many.[10,13,21,22,23] Others, however, have reported disappointing results[15,17,24] more recently. Sutherland et al[25], again postulating predominantly right ventricular injuries, reported that dyskinesis of the RV wall was common. Halliday[13] concurs, and postulates that again, because of the lack of muscle mass, myocardial damage of the RV is not as easily visualized by scanning techniques.

A final technique that has yet to be fully evaluated is that of two-dimensional echocardiography. King et al[26] report the sector scans of seven patients with elevated CPK-MB. Six of these patients showed clinically unsuspected ventricular abnormalities. Interestingly, one patient in the present study underwent echocardiography which demonstrated the contusion as RV dyskinesis.

Finally, perhaps the most startling result of the present study was the strong predominance of LV injury. As noted previously, most authors assume that there is a predominance of RV contusion[12,13] yet EKG and scanning techniques are insufficient to clearly identify RV contusion. A few explanations for the discrepancy exist. Because this is a post-mortem review, it may be postulated that LV injury carries a more ominous prognosis. It is also possible that pathologists may not have examined the smaller muscle mass of the RV as carefully, and hence may have missed some cases, although this is felt to be unlikely. The third possibility is that previously held views of RV vulnerability are wrong. Once can postulate a "contra-coup" type of phenomeon, such as is seen in the brain. Cooper et al[14] in experiments with pigs, observed widespread RV, LV and septal injuries and postulated a "shock-wave" effect.

Conclusion

Recognizing the limitations imposed by incomplete data and a small number of patients, some useful patterns have emerged from this study. Cardiac contusion should be suspected in the presence of other sequela of blunt chest trauma, particularly fractured ribs and pulmonary contusion. Contusion behaves much like an acute myocardial infarct, although EKG and enzyme changes are suggestive rather than diagnostic. Contusion should be considered in the face of blunt chest trauma when the patient fails to respond to adequate volumes of resuscitation fluids and shows high central filling pressures. Left ventricular contusion may be more common than previously suspected. Two dimensional echocardiography may be more practical and more specific than radionucleotide scanning as a means of confirming the diagnosis.

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The Book Shelf

Emergency Medicine Concepts and Clinical Practice

Senior Editor – Peter Rosen, M.D.
Associate Editors – F.J. Baker, M.D., G. Richard Braen, M.D., Robert H. Dailey, M.D., Richard C. Levy, M.D.
The C.V. Mosby Company,
St. Louis-Toronto-London – 1983,
1626 pages. Two volumes $131.

Dr. Peter Rosen and his editorial staff have confronted the immense task of producing a comprehensive textbook of emergency medicine. Others have made similar attempts in the recent past but Rosen's work does indeed appear to be the most comprehensive to date.

With its design and multiple authorship resembling "Harrison's Principles of Internal Medicine", this text is somehow reassuringly familiar despite its very recent publication. The two volumes are divided into three parts: General Concepts, Trauma and Non-Trauma. The section on General Concepts is more extensive than other texts in Emergency Medicine. Basic science, history and philosophy are combined in this section, which, for the most part, permits easy reading.

The Trauma section is adequately represented and demonstrates areas of particular strength in some of the chapters pertaining to environmental injuries. Some weaknesses are evident in the presentation of Ophthalmologic problems. However, this area of emergency medicine is poorly handled by other texts as well.

Part three, Non-Trauma, appropriately occupies more than 60% of the entire text and could possibly be expanded in later editions to an even greater percentage. Noticeably absent in this edition are the topics of infectious disease emergencies and medicolegal considerations. Infectious diseases are discussed as complications of various organ systems but are only strongly represented in the chapter on the Respiratory System. The discussions of Psychiatry and Central Nervous System dysfunctions could be stronger. In the first edition, only the elements of stroke, seizure, vertigo, syncope and suicide are considered in a section entitled "Neuropsychiatric Problems". It must be added that these are supported by a discussion of "Coma" in Part I and "Head Trauma" in Part II. Finally, the section "Selected Pediatric Emergencies", although well written, is quite brief consisting of only thirty-five pages or two percent of the entire text. Child abuse is not discussed.

Considering the entire text, the work of Rosen et al can be considered a welcome and valuable addition to the reference library of most emergency physicians. The price, at $131.00 Canadian, is rather discouraging for the individual. However, the text should at least be available as a central reference in the Emergency Department. Most chapters demonstrate comprehensive diagnosis and emergency management quite well and are also useful as primary sources for the presentation of seminars at the graduate, as well as under-graduate levels. The bibliography accompanying each chapter is, with a few exceptions, very extensive and can adequately support most of the weaker chapters.

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Candidates for the position of Chief should be board eligible in Emergency Medicine and should have previous administrative experience in an Emergency department. Bilingualism is also an asset. Interested candidates should direct inquires and curriculum vitae to:

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Sir Mortimer B. Davis – Jewish General Hospital,
3755 Cote Ste. Catherine Road, Room A-142,
Montreal, Quebec H3T 1E2

Emergency Physician Required

St. Joseph's Hospital, Hamilton
Full-time, career oriented
Minimal requirements – Ontario licensure, CMPA member current certificate at provider level in BCLS, ACLS, ATLS. Additional training and/or experience preferrable. 35 hours per week clinical work plus additional hours in teaching, administration, research, audit, and career development. St. Joseph's is a comprehensive general hospital, 500 beds, 44,000 ER visits per year, affiliated with McMaster University Medical Centre and Mohawk College and will have administrative and clinical responsibilities for Canada's first free-standing emergency facility.

Salary from high 50's to mid 70's depending upon experience and training. Full benefit package with generous holiday and study time allowance. Position available in near future.

Write or call:

Dr. K. Dwyer
Emergency Department
St. Joseph's Hospital
50 Charlton Avenue East
Hamilton, Ontario L8N 1Y4
area code (416) 522-4941, extension 7112, 7113

Offre d'emploi

L'équipe de médecins de l'Urgence du Centre Hospitalier de l'Université Laval est à la recherche de 2 candidats:

- le premier devant rentrer en fonction le 1er février 1984 ou le 1er juillet 1984,
- le deuxième, pour le 1er février 1985 ou le 1er juillet 1985.

Il s'agit d'une pratique essentiellement de Médecine d'Urgence, en raison de 25 à 35 heures/semaine à l'intérieur d'une équipe de 10 médecins.

Exigences:

1) Formation academique

A) soit une résidence en Médecine d'Urgence
B) soit une année de résidence en Chirurgie avec une année de résidence en Médecine Interne
C) soit 2 années de stages variés en Chirurgie, Médecine et Pédiatrie
D) soit une formation en Médecine Familiale suivie d'une année en Médecine d'Urgence.

2) Aptitude et gout pour l'enseignement

Etudiants de 4e année, internes, résidents, personnels infirmiers, ambulanciers.

Si intéressés, faites parvenir curriculum vitae ainsi que 2 lettres de références à:

Pierre Champagne, M.D.
Département d'Urgence
C.H.U.L.
2705, boulevard Laurier,
Québec, Qué. G1V 4G2

Gameau Emergency Medical Services

Gameau Emergency Medical Services has a vacancy for an emergency physician to work in the Emergency Department of the University of Alberta Hospitals. Preference will be given to applicants who have completed a residency programme in emergency medicine. In addition to patient care, the successful applicant will be expected to participate in teaching, and the post carries a faculty appointment.

Applications with curriculum vitae and the names of three medical referees shoud be sent to:

Dr. J.M. Davidson,
Director, Division of Emergency Services,
University of Alberta Hospitals,
Edmonton, Alberta T6G 2B7