Vol 4, No 1, January 1983

CAEP REVIEW

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CAEP REVIEW

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Resident's Corner

The Resident's Committee met during the CAEP Annual Scientific Assembly in Calgary on September 28, 1982; at that time, in spite of the early hour, there was a large turnout, and good representation was achieved from a majority of centers. This response was particularly gratifying, in view of the inactivity of the Committee, in the past, due to lack of interest, and it is hoped that the Committee will now become productive.

Appointments included:

Chairman:	Donald Livingstone (London)
Vice-chairman:	Robert Foxford (Montreal)
Representatives:	Douglas Dersnah (Kingston)
	Ingrid Vicas (Calgary)

Representation from the other centers will be vital to the continued functioning of the Committee, and it is hoped that all Residents will feel free to contribute to it.

In addition to Ingrid Vicas's report on the activities of the Committee over the past year, a review of each of the teaching programs was made. Although the curricula of these programs are currently in flux, it is hoped that once they are more stable, and presumably conform to Royal College of Physicians and Surgeons of Canada guidelines, they will be published in the CAEP Review.

The Residents Committee defined a number of objectives for the next several years. Currently the Committee is exploring the possibility of liaison with CAIR, in the hopes of establishing a mutually satisfactory relationship. CAIR has large resources, both in terms of personnel and expertise, that could be of benefit to the development of Residency Training in Emergency Medicine in Canada.

Although the Royal College of Physicians and Surgeons of Canada will be assessing Training Programs in Emergency Medicine in the next year, Residents present at the meeting expressed an interest in developing a Resident sponsored audit of their programs. The perspective of such an audit would be unique; it would focus principally of the quality and content of the Training Programs, and could potentially make a significant contribution to the quality of Emergency Physicians in Canada.

The Committee also noted that Residents currently experience a duplicity of effort in organizing electives; prior to making the appropriate contact for an elective, numerous enquiries are usually made, following paths which often have been travelled by others previously. Consequently, the Committee urged the development of a reference bank of outstanding electives, particularly in such areas as trauma; Pediatric Emergency Medicine, pre-hospital care, and research, which would be available to others. Although it is hoped that these electives will be oriented to Canadian Emergency Medicine, I would encourage any Residents who have had an elective that they feel might benefit others to advise me, so that it might be inserted in the bank. It is only through enthusiastic input at this time that a useful bank of electives can be developed for future use.

A concern was also expressed that variations in procedures and deadlines unnecessarily complicate current applications to the various programs. It was the hope of the committee that this problem could be explored over the next year with the various program directors in an attempt to unify and simplify the applications.

Finally, a second meeting, involving the various program representatives, is planned for February, at which time these problems will be explored further. It is hoped that by then representation from those centers not present at the Annual Assembly will have been established. If you have any concerns that you feel should be addressed by the Resident's Committee, please advise your local representative, or attend the meeting; it is only through enthusiastic support that Residents will be able to achieve a significant input into Emergency Medicine in Canada.

Donald Livingstone
Chairman, Resident's Committee

From the Editor

A sophisticated readership survey! That, of course, is what the erroneous vector diagram was in the last issue of the Review, contained in the ECG Rounds. A few astute readers pointed out the mistake to Dr. Fulton and myself after we had conferred on this subtle testing technique.

On page 123 of C.R. 3(4), the ECG of Case I was incorrectly analyzed.

In lead I,

R wave = +5
S wave = 0
∴ +5 should be plotted on the lead I axis

In lead II,

R wave = +3
S wave = −11
∴ −8 should be plotted on the lead II axis

The resulting vector is different from that reproduced on page 123. There, we had calculated an axis of −40°, whereas in fact, it is closer to −75°. Both vectors signify left axis deviation, but there is a difference in magnitude. Plot it yourself as an exercise.

This issue of the Review marks the start of our fourth year of publication – time flies when you're having fun! With this issue we open a debate which I am sure will be a lively and hopefully, productive one within CAEP – the debate on the medical consequences of nuclear war. Dr. Eric Letovsky, a Toronto emergency physician, has contributed a thought-provoking article on the topic and has drawn it into focus for CAEP members. This will, in all likelihood, be debated at the 1983 Annual Meeting in Toronto, so I urge you to consider the issue and the course of action you feel appropriate for yourself and for CAEP in the area.

Ontario readers may have read a front page article in the November 29th issue of *Ontario Medicine*, a new medical newspaper in Ontario regarding Emergency Medicine. The article quoted extensively general practitioners who staff suburban Toronto emergency departments. Unfortunately, it did not present a balanced perspective of the pattern of practice of Emergency Medicine in North America. In particular, a blatantly untrue and defammatory statement was quoted from one of these physicians regarding my use of statistics in the pages of the Review. We have requested and expect to receive a retraction, as well as an article presenting a more balanced view of Emergency Medicine in Canada. It is indeed unfortunate that the debate on the delivery of emergency care to the Canadian public must be reduced to such a level.

Peter Lane, M.D.

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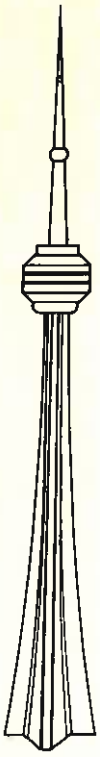
President's Notebook

Since the inaugural meeting of the Canadian Association of Emergency Physicians four years ago, Emergency Medicine in Canada has made significant strides. Certification is a reality and residency training programs seeking Royal College accreditation are proliferating across the country. C.A.E.P. has been active in promoting the views of Emergency Physicians throughout this process. One of the main reasons that C.A.E.P. is able to present such a strong voice in Emergency Medicine is the extent and distribution of the membership. At the present time, there are 462 members of the Association in five categories. In order to continue the high profile it has achieved, it is necessary to not only maintain but expand the membership. As I am sure all of you know, the renewal notices have been distributed. The response has been disappointingly slow. At the present time, less than half of the membership have renewed. In addition to the expense of repeated renewal notices, the time commitment of the membership committee is considerable. The second notices are now in the mail and I would encourage all of you to respond as soon as is conveniently possible.

Concern has been expressed from several members regarding the change in fee structure. As all of you know, the dues for active members have been increased to $175.00 per member. This decision was made by the executive prior to the annual meeting and ratified by the membership at the annual meeting. For those of you who were unable to attend the annual meeting, I will attempt to outline the reasons for this. Over the past two years, the Association has realized significant income from the annual meeting. This income has been used to carry on the activity of the Association. In spite of the expenditures exceeding dues revenue, we have continued to maintain a surplus. In 1982, there has been a drastic turn-around. The annual meeting in Calgary is expected to roughly break even. In order to maintain the current activity of the Association, it is necessary to bring the dues in line with those of other specialty organizations. Despite the recent publicity and emphasis on "six and five" the burden has fallen upon the membership to maintain the activity of the Association. Although we



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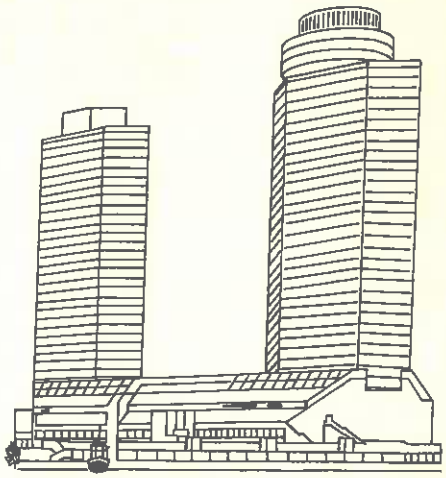

will attempt to continue to generate income from the annual meeting, this is by no means a certainty.

To those of you who have already responded to the renewal notice, I would like to thank you for your promptness. To those of you who will be receiving second notices, I would urge you to reply as soon as possible. The ongoing activity of the Association is based heavily on a broad based support of membership.

All of you have received the recent supplement to the C.A.E.P. Review entitled Emergency Units in Hospitals. These guidelines were prepared by a sub-group on Emergency Units in Hospitals for the working group on special services in hospitals of Health and Welfare Canada. This is an important document and I'm sure will be of use to all of you who have administrative responsibilities in Emergency Medicine. On behalf of the Association, I would like to thank Dr. Peter Lane for his input into the preparation of this document as the representative of C.A.E.P.

Pediatrics forms a large component of Emergency Medicine. There appears to be some interest among Toxicologists and Pediatric Emergency Physicians for the formation of an umbrella committee that would represent physicians practising in those areas. The formation of a pediatrics section or committee within the Canadian Association would provide not only a forum for pediatric emergency physicians but also a strong base within the Association for this important component of emergency care. Unlike adult emergencies, the number of pediatric emergencies in any individual center tends to be small. There is less opportunity for us to get the broad based experience in dealing with these problems. The emergence of a Pediatric Section would help us establish guidelines for the practice of pediatric emergency medicine and contribute to the educational program in this area at our annual meeting. On behalf of the Association, Dr. Powell is pursuing this activity and I hope to have more to report to you in the near future.

Trauma is the leading cause of lost life years in our society. Advanced trauma life support programs are proliferating across the country. These programs provide a unified comprehensive approach to the initial "golden hour" of trauma care. Emergency physicians have been active in the establishment and teaching of these courses. Plans are now under way for the formation of a Canadian society of physicians involved in trauma care. With emergency physicians in the front line of caring for patients involved in multiple trauma, it is important that the Association take a leadership role in this forum. Plans are now under way for C.A.E.P. to establish a working group to propose a position paper on the subject of trauma care. As well, Dr. Peter Lane is acting as the C.A.E.P. liaison in the formation of the trauma society. I would encourage any of you who have strong interests or concerns in trauma management to correspond with Dr. Peter Lane to express your interests and concerns.

Although no firm figures are available at this time, there has been favourable response to the Royal College Exam in Emergency Medicine. I would like to congratulate all of you who are taking an interest in participating in the examination process. Best of luck in your studies in the coming year. The work involved in preparing for this exam will be significant.

Best wishes to all for the holiday season.

ROCCO GERACE, M.D.

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The Authority Concept: A Method of Administrating Prehospital Emergency Services

by Robert Johnson, M D

North American EMS is said to be in crisis. Specifically in Canada new EMS systems are in the process of being inaugurated (e.g. Edmonton) while existing systems are being drastically modified or being phased out (e.g. Calgary, Winnipeg). There are no generally accepted rationales for how best to finance, manage, and organize such systems. Even the more basic matter of whose responsibility it is to provide such services is a very controversial one. Local officials in some communities consider it a municipal one similar to police and fire protection, while officials in other areas view it as strictly a private sector function. In cities where the private sector was unwilling to provide service or provided notably bad service, local governments have become involved in the direct provision of ambulance service, often by default.

The authority concept will be presented here as one alternative method to manage and organize an EMS prehospital care system.

In Canada private (for profit) operators have classically provided transport systems. In many jurisdictions these have grown out of funeral parlor operations. Systems such as this offer advantages of cost containment & foster free enterprise. In a era of sensitivity regarding government bureaucracy, there may be a strong argument for maintaining such operators. Disadvantages are multiple however, especially when any advances past basic life support are considered. Medical control tends to be nonexistant; such systems are separate and distinct from the rest of emergency medical care, thus undermining the concept of a unified approach to the medically ill or injured patient from bystander assistance to definitive hospital care. Fire based systems have been tried extensively in the United States (Los Angeles and Seattle being the prime examples). The experience in Calgary has proved that there are major problems with such systems. The underlying difficulty is what has been termed the "structure – function mismatch"[1]. That is the administrative structure is basically formed so that the duties of fire control and suppression are performed well; the function of an advanced life support system has vastly different requirements not the least of which being medical control, on going medical training, research, and evaluation. Calgary is currently reviewing the splitting of ambulance from the fire department; Winnipeg has placed on hold plans to integrate the ambulance into the fire department[2].

City or provincial government departments may take direct responsibility for prehospital services. Pittsburg is an example of such a 'Third Service'. This places the prehospital care service at least on par with police and fire departments in terms of vying for funds, being able to manage their own personnel, setting standards, obtaining the services of a medical director. This system, however, may be more expensive. It involves a different set of buildings, different support staff. Wages and working conditions are tied to city union demands. Furthermore the department would normally have its vehicles serviced at city garages; its supplies obtained through the city purchasing department, none of which may be in the best interests of the ambulance service. Since prehospital care must be coordinated with various other levels of government and free enterprise, a city department may be mismatched with, for instance, a provincial department of health which is trying to institute a more regional ambulance program.

One solution to many of these problems is the authority concept for managing and organizing prehospital care services. The concept as a method of managing a public service is not without precedent; e.g. parks, airports, convention centers etc. The authority concept for prehospital care services can be equated with the municipally owned hospital board. The responsibilities of such a body include[3]

(1) assumption of top level management responsibility for the financial affairs of the service system.
(2) cost containment.
(3) proposing rate structures and subsidy arrangements and recommending tradeoffs between these two revenue sources.
(4) acquiring the use of appropriate facilities and capital equipment necessary to system operations.
(5) conducting procurements and managing subcontractors in interests of the public.

Such an authority has been created to provide prehospital care within Edmonton. The Authority was created by an act of the Alberta Legislature (Bill P.R. 7)[4]. The Authority is an autonomous entity responsible for the provision and regulation of ambulance services within the city; it operates under the direction of a board representing the City, health services in the community, and consumers. The makeup of the board is absolutely critical to overall system performance, particularly long range performance. The board should be based not upon political representation but upon the need for specific kinds of expertise necessary for the day-to-day management of a multi-million dollar health care organization.

The authority method offers many advantages[5]. Accountability is enhanced when there exists a specific body charged with providing the service. Complaints, suggestions, recommendations are easily focused on the authority, avoiding the problem of a physician talking to a fire chief about a medical problem in a fire based system; or a consumer complaining about service to a private operator who has neither the finances nor the training resources to rectify the problem; or the issue becoming a city council political football if the service is a city department. This accountability by the

board further frees the city from any possible legal action. The authority board is responsible for the activities of their members.

Financially the authority, although separate from the city will have any budgeted deficit covered by city revenues. This arrangement, for instance, allows the authority to operate its collection function much more aggressively than might otherwise be done, without bringing upon another agency (e.g. fire department) complaints from the public not used to paying for health services. Furthermore equipment may be acquired according to authority requirements without involving the city in tendering or evaluations. Services may be bid upon by the authority to obtain the most reasonable price; which may or may not mean that ambulances are serviced or fueled at city garages. (In Edmonton they are not). Thus some degree of financial independence is possible without the absolute requirement to make every run or procedure pay as in a private (for profit) enterprise; and without the attitude 'money is no object' often found in purely public run services.

Another financial plus in an authority is that rate increases can be negotiated quickly with a minimum of political interference. The public can be assured that the increase is going to needs designated for the increase (rather than to subsidize another department).

Employee benefits can be tailored specifically to the needs of prehospital workers, thus avoiding the problems of being immediately locked into a city union contract, which may be very restrictive in terms of continuing education, overtime, discipline for medical reasons, or special incentives for superior performance.

An authority may well be a recipient of donations; an occurence that would be most unlikely if the ambulance service is private or a city department. The Edmonton Ambulance Authority received their 'baby buggy' as a donation. In summary then the financial advantages are considerable.

Medical control as well as evaluation and research is also more easily performed under an authority. These functions are achieved minimally if at all in a private system and variably (Seattle vs Calgary and Los Angeles) in a fire based ALS service. For instance monies for research may be obtained from other sources than the usual agencies responsible for funding service requirements. A medical director may be part of the system in an authority much more easily than in a fire based service and may be included in the roster as a part time emergency room physician.

Other institutions can easily deal with an authority and its board; Local hospitals will have representation on the board. However on a day-to-day basis problems can be solved between equals: authority board to hospital board, hospital administrator to ambulance authority manager. This may enhance the ease which ALS crews are brought into the ER's or OR's for updating, the ease with which base stations are established in the ER's or the ease which ride alongs are arranged for hospital staff. The authority also can interact easily with surrounding services to provide a coordinated effort both in terms of regional dispatch and mutal aid agreements. The authority by virtue of its board with representation both from the public and physicians fits well into most provincial policy for a coordinated ambulance service but on a local basis.

Disadvantages of the authority concept include the consideration that such a system moves away from a totally free enterprise approach and the resulting pressure to keep costs at a minimum and revenues at a maximum. Any subsidization or grant assistance to a non profit organization becomes more apparent to the public than one in which monies were applied directly to a government department. Furthermore if ambulance services already exist, establishing an authority may involve either a 'buy out' of the private operator or if the system is fire based will involve new facilities with possible resulting duplication.

For efficiency of operation, improved medical control, financial independence, and coordination with other governments, the authority concept appears to be a viable alternative to provide advanced life support services to communities in Canada. The Edmonton Ambulance Authority has been in operation since July 1981 and has been providing such services since January 1982. Studies are currently underway to attempt to confirm its efficiency and its effectiveness.

References

(1) G.P. Belton et al, Organization Review Project (Calgary: City of Calgary Fire Department, Ambulance Division, August 1982) P. 142.

(2) Personal Communication, J. O'Toole, Chairman, Medical Standards Committee, Winnipeg Ambulance Service, October 1982

(3) J. Stout, "The Public Utility Model, Part II JEMS, June 1980 P. 36.

(4) Bill P R. 7 Edmonton Ambulance Authority Act, June 1981.

(5) "Emergency Medical Services -- Edmonton Ambulance Authority" Memorandum prepared by Emergency Medical Services Office, February 1981.

ECG Rounds

by Lynne Fulton, M.D.

Case

A 27 year old male with acute appendicitis was asked if he had a history of any medical problems, and replied that he had been told that he had a "heart problem". As a result of this, the nurse did an electrocardiogram.

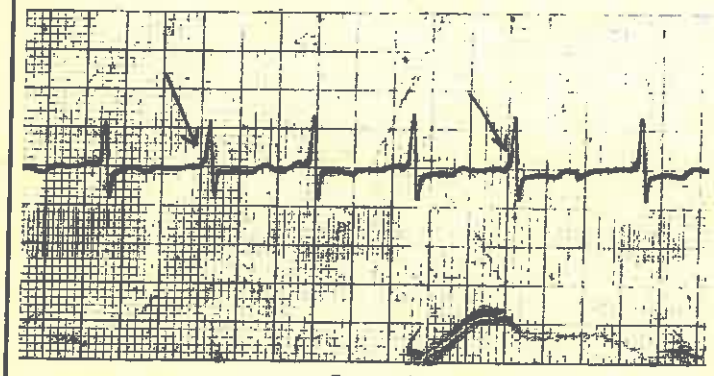

Figure I

See page 15 for interpretation of results.

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Abstract

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CẠO GIO: The Pseudobattered Child

by Norman R. EADE, D.Phil., M.D.C.M., Oren K. STEINMETZ, B.Sc.

Abstract

Cạo Gio is a vietnamese folk remedy for fever, cough etc. It involves topical application of a skin irritant and forceful rubbing of the skin to produce linear purpuric lesions. The appearance of these lesions and in this case their bilateral nature caused them to be initially mistaken as child abuse. The physician should be familiar with the appearance of these patterns of bruising to avoid future confusion.

Resume

Cạo gio est un remède populaire vietnamien utilisé pour soigner la fièvre, la toux, etc. Il consiste à appliquer localement un agent irritant et à frotter énergiquement la peau afin de produire des lésions purpuriques linéaires. A cause de l'aspect de ces lésions, et dans ce cas particulier, de leur nature bilatérale, on crut d'abord être en présence d'un enfant maltraité. Le médecin doit pouvoir reconnaitre l'aspect de ces ecchymoses afin d'éviter des méprises futures.

Key words

folk remedies, pseudo-child abuse, counter-irritation, cao gio, Vietnamese refugees.

Mots-clés:

remèdes populaires, enfant pseudo-maltraité, révulsion, cao gio, réfugiés vietnamiens.

Introduction

The introduction of Indochinese "boat people" to Canada and the United States has provided an opportunity for North American doctors to encounter diseases[1,2,3] which may fall to be diagnosed because of the unfamiliarity.

*EADE, Norman R., D.Phil., M D C.M., Associate Professor of Pediatrics/Pharmacology & Therapeutics, McGill University, Montreal, Quebec H3G 1Y6, Canada and The Montreal Children's Hospital, Montreal, Quebec, H3H 1P3, Canada

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In the context of western medicine, the therapeutic measures used by this population to treat illnesses are equally strange and may seem to be irrational, if not bizarre.

The present case report describes one such treatment involving "massage" or "rubbing" which is widely used in South East Asia. The technique, which combines the use of massage with topical medications, is called, in Vietnamese, Cạo Gio ("scratch the wind"). The treatment produces bilateral purpura, ecchymoses, and abrasions of the skin, which, in our case, were confused with the traumatic lesions of child abuse.

Case Report

A five year old Vietnamese girl was seen in the Emergency Room of The Montreal Children's Hospital accompanied by her father. The father stated that his child had a cold and was afraid that she might have developed pneumonia. On physical examination it was discovered that the child had broad, linear, bilateral, purpuric-ecchymotic lesions of recent origin on the back, at the base of the neck, and over the thoracic and lumbar vertebrae, as well as along the intercostal spaces, and on the scapulae in an "F"-like pattern (Fig. 1)

Figure 1

— Bilateral purpuric lesions on the back of a 5 year old Vietnamese child which may be confused with the inflicted lesions of child abuse.

The examining resident found the lesions on the child's back suspicious and considered the possibility of child abuse. On questioning the father regarding these lesions, the father explained that he himself had made them using a form of Vietnamese folk medicine called Cạo Gio. He then demonstrated the technique and explained its intended value. The skin of the back was first covered with an oil or ointment applied by the fingers with rubbing and friction. Following this, the edge of the porcelain soup spoon (familiar to us from Chinese restaurants) was heated in warm water and then used to vigorously rub the skin to produce the bruising described. The child was discharged in the care of her father after culture of her throat for

Group A β-hemolytic streptococci. No subsequent treatment was required.

Discussion

The "massage" or "rubbing" technique, known as Cạo Gio, is generally considered a home treatment for colds, flu, headache, fever, etc.[4,5,6,7,8]. Like other Indochinese traditional medicine, it apparently derives from classical Chinese medical principles,[9] and the pattern of bruising, indeed, appears to correspond to the meridiens of acupuncture[4,10] with localization along the vertebrae and scapulae. Over twenty other techniques of massage therapy are practised regularly in China for treatment of ailments as diverse as poliomyelitis, rheumatoid arthritis, muscle strain, and infantile diarrhea.[11,12] Frequently conventional "western" medicine is employed simultaneously with massage, as in the case with bronchopneumonia, where antibiotics, herbal remedies, and "rubbing" techniques may all be employed in achieving a cure.[13]

Actual techniques of Cạo Gio vary. The use of a soup spoon, as described by the father in this case, has been reported elsewhere.[10] Other methods include rubbing the skin with a hair covered egg, a coin, or pinching the skin between two coins or the fingernails.[4,6,14] In addition to the back, the intercostals of the anterior chest and the biceps are also massaged in some cases.[4,6]

Apart from the technique itself, the medications employed are of interest. One of the preparations used in this case, and supplied to us by the patient's father, is called "Tiger Balm" ointment, and appears to be a therapeutic staple of the South East Asian and Chinese community of Montreal. The principle ingredients were camphor and menthol. Another ointment encountered was "Red Flower Oil" whose main ingredient was methyl salicylate. It is of interest that all of these agents also appear in western "folk medicine" as counter-irritants, designed, through application and friction, to produce erythema and a sensation of warmth in the affected area.

An observation by Dahlberg sub-titled "Iatrogenic Lesions"[15] in an article on nutritional and other diseases likely to be encountered in Cambodian refugees, describes a possible error in diagnosis between bruising secondary to medical treatment and the bruises of child abuse. He states "Do not be alarmed if you see large ecchymoses, especially symmetrical. Ask the patient if a native practitioner has massaged him lately". Despite this, confusion of this type of bruising with child buse has previously been reported.[5,6,7,8,16] The case described by Nong The Anh as reported in the Vietnamese weekly Trang Den was particularly tragic.[6] In this case the child died of influenza, however, because of the presence of ecchymoses on his chest and back, the father was suspected of child abuse. The father was reportedly jailed, and said to have subsequently committed suicide.

The lesions produced by Cạo Gio are clearly not child abuse, but are inflicted injury performed with the intent to remove pain and suffering, rather than to produce it. They resemble, in their intent, cupping and moxibustion with or without scarification, where the possibility of producing first, second and third degree burns is present. In folk medicine of the Mexican American community, such treatment, accompanied by prayer, suction, pressure, or vigorous shaking of an infant may be applied for "mollera caida" (fallen fontanel), in an attempt to return the fontanel to the normal position.[17]

It is of interest that treatment involving heat and massage may be effective for the purposes for which they are intended. Melzac et al[18] have recently demonstrated that cold and massage, either singly or in combination, when applied to the space between the thumb and the index finger, are capable of decreasing pain of toothache by 50% or greater. To our knowledge heat has not been tested in this same fashion, but the production of localized heat by chemical irritation or massage may produce the same effect.

A major reason that this case was initially thought to be child abuse was the bilateral, symmetrical nature of the lesions. Non-inflicted bilateral lesions of a traumatic nature have been shown to be very rare[19,20] and their presence should alert the physician to consider abuse as the etiology; it is important to realize the possibility of folk medicine as an alternate etiology, particularly as our population in Canada becomes more diverse.

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Case Conference

Disseminated Gonococcemia

by Charles Ramesar, M.D.*

Introduction

The typical early symptoms of sexually transmitted diseases are usually recognized by the patient who may come to the Emergency Room seeking confirmation and urgent treatment. However, once these infections develop past their primary stage, most patients and many physicians fail to recognize symptoms and signs as being caused by venereal organisms. This case discussion is aimed at increasing awareness to the signs and symptoms of advanced gonococcal infection and so prevent delayed or missed diagnosis.

Case Presentation:

A 21-year-old female presented to the Emergency Room with a 24-hour history of fever, generalized myalgia, and a swollen and painful right knee. She had been dancing the previous night but had not injured herself, and woke the next morning with the symptoms described. Her menstrual period had just begun. Last intercourse was several days previous and she denied vaginal discharge, but six months earlier she had been treated for gonorrhea and her discharge had returned 2 months later but resolved without further investigation or treatment. Past history included two therapeutic abortions 3 years earlier but no other significant medical illnesses, in particular no history of arthritis. She was on no medication.

On examination, she was flushed and ill-looking. Temperature was 38.6°C, blood pressure 130/70 mm Hg with no postural change, and pulse rate 88/min and regular. Head and neck exam showed slightly injected conjunctivae, an erythematous pharynx with no exudate, and no enlarged nodes. Chest and abdominal exams were negative. Musculoskeletal exam revealed a hot and swollen right knee, held in flexion, with pain on minimal movement. She was tender over the spine at L1 level. No skin lesions were seen.

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Pelvic exam was normal except for active menstrual bleeding. Laboratory testing showed Hg 14.3 gm, WBC 10,900, and normal electolytes, glucose, BUN, and liver function. Aspiration of the right knee joint produced turbid straw-colored fluid that on gram stain showed numerous pus cells but no bacteria. X-rays of the knee and lumber spine were normal.

A diagnosis of septic arthritis, probably gonococcal, was made and the patient was admitted to hospital for further investigation and treatment. She was started on intravenous penicillin G, 3 million units q6h, on admission and within 24 hours she was afebrile with decreased pain and inflammation of the knee. Blood cultures and cultures of joint fluid, pharynx and rectum were negative, but a cervical swab grew Neisseria gonorrhoeae with a positive fluorescent antibody test. A bone scan to investigate the back pain was negative, and she was discharged home after 4 days of intravenous penicillin, asymptomatic, with advice to continue oral penicillin V 300 mg q6h and to follow up her positive cultures with the public health nurse.

Discussion

This case illustrated some of the features of disseminated gonococcemia but other important features were not manifested and will be discussed below.

Gonorrhea is the second most prevalent communicable disease after the common cold[1], with the attack rate increasing each year. Some experts feel it will only be eradicated when people stop having sex for fun. About 1-3% of adults with untreated gonococcal infection develop gonococcemia, and about ⅔ of these are women.[2] This is likely due to the fact that in 9 out of 10 males the infection is apparent within a few days of exposure, with discharge and intense urethritis, whereas 90% of females with lower tract infections are asymptomatic. Oral contraceptives may also facilitate the infection by

Photo courtesy of Dr. H. Vellend, Division of Infectious Diseases, Toronto General Hospital

increasing the moisture and alkalinity of the vagina, both of which are favored by the organism. Nearly ½ of female patients are pregnant or menstruating at the time of onset of systemic symptoms. Once in the upper tract the infection can spread systemically to produce bacteremia leading to arthritis or endocarditis, or remain locally to produce tubo-ovarian abscesses, peritonitis, and acute or chronic pelvic inflammatory disease.

Although it may be asymptomatic in some patients, the bacteremic process in ⅔ - ¾ of patients is accompanied by symptoms of chills, fever, malaise, polyarthralgia, and ½ develop skin lesions of gonococcemia.[3] These septic dermal infarcts consists of erythematous papules which develop into hemorrhagic, necrotic, or vesiculopustular lesions. Usually 3-20 such lesions appear on the distal extremities. The joint involvement is typically an asymmetric tenosynovitis involving several joints, most often knees, ankles, wrists, and fingers.

Tenosynovitis at the wrist or ankle is a useful diagnostic sign since it is seen more frequently in association with gonococcal arthritis than any other form of arthritis.[3] Arthritis is also the commonest sign of disseminated gonorrhea regardless of the site of primary infection i.e. genital, rectal, or pharyngeal. Although the joint involvement may be the symptom that brings the patient to hospital, the key to diagnosis is the skin lesions of the bacteremic phase as they are quite typical of gonococcemia (Photo). The systemic symptoms of bacteremia may spontaneously subside without treatment or septic arthritis may develop. Investigations once the diagnosis is suspected are directed to identifying the gonococcus in blood or tissue sites. The more sites that are cultured, the greater the chance of recovering the organism, therefore the throat, the cervix in females and the rectum and urethra in males and females should be cultured. Septicemia and arthritis 2° to gonococcal pharyngitis has been documented[4], and a common source of dissemination in males, usually homosexuals, is insufficiently treated or untreated anogenital gonorrhea. Cultures of skin lesions are rarely positive but gram stains of smears reveal the organism in about ½ of cases. Blood cultures are also rarely positive in the absence of gonococcal skin lesions, and are only positive in ¼ of those with lesions.

Synovial fluid culture may identify the organism in ¼-⅓ of cases, but the gonococcus is seldom recovered simultaneously from blood and synovial fluid.

Complications of disseminated gonococcemia, apart from progressive destruction of the septic joint, include pericarditis, endocarditis, hepatitis, and meningitis. An unusually large number of skin lesions, major embolic phenomena, or changing heart murmurs suggest the presence of endocarditis.

The differential diagnosis includes other forms of septic arthritis, acute rheumatoid arthritis, and S.L.E., although the gonococcal arthritis-dermatitis syndrome is probably the commonest form of acute arthritis in young adults. Gonococcemia complicated by myocarditis can mimic acute rheumatic fever; and by hepatitis can mimic hepatitis B viremia. Patients with Reiter's syndrome, usually male, may have gonococci growing in the urethra coincidentally, but can be distinguished by the fact that a sterile discharge persists after treatment and they have characteristic mucocutaneous lesions (oral ulcerations, balanitis).

Treatment:

High dose intravenous penicillin G followed by oral ampicillin and oral ampicillin alone are equal first choice regimens for treatment of uncomplicated disseminated gonococcal infection.[5] The recommended penicillin dosage is 10 million units/day intravenously until improved, followed by ampicillin 2 grams/day to complete 7 days total treatment. The oral ampicillin regimen for hospitalized or selected ambulatory cases is 3.5 grams orally plus 1 gram probenicid, followed by 2 grams/day for seven days. Alternatives in PEN allergic patients include oral tetracycline 0.5 gm Q.1.D. for seven days (not in pregnancy) or erythromycin 2 gm/day for 1 week.[6]

In summary, this patient illustrated some of the typical features of disseminated gonococcemia — a young female on the birth-control pill with an asymptomatic genital infection that disseminated during menses to produce an arthritis along with other symptoms of bacteremia. Both blood and synovial fluid cultures were negative but an endocervical swab grew the organism. Although the characteristic skin rash was absent the resolution of symptoms in 24 hrs with penicillin was a reliable diagnostic sign.

Question:
Was this patient a candidate for outpatient management?

Comment:
Oral ampicillin therapy initiated on an outpatient basis should only be given to those patients with typical manifestations without complications who have had all the appropriate diagnostic tests and who are reliable.[5] This patient with suspected disseminated gonococcal infection did not present all the typical features of the arthritis-dermatitis syndrome and hospitalization for further diagnostic studies and supportive care was appropriate.

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ECG Rounds

Interpretation

rate: about 120, slight variation with respiration

rhythm: sinus

PR interval: .07 - .12

P waves: present

QRS complex: .08, slurring of the initial portion of the QRS at times

ST segment: normal

T waves: biphasic

Summary: Supraventricular tachycardia with variable accelerated conduction.

Discussion

Accelerated conduction is present when all or some portion of the ventricle is activated by atrial impulses earlier than might be expected if the impulses were to reach the ventricles only by way of the normal cardiac conduction pathways.[1] In a few instances, there may be accelerated conduction within the AV node itself. Classically the electrocardiogram shows a short PR interval followed by a widened QRS complex with a slurred initial deflection, the delta wave.

In most instances of accelerated conduction, the cause is the presence of an accessory pathway. These include the following:

Kent Bundles — electrically active fibres that bridge the atria and the ventricles. Most frequently these are anteriorly, bridging the right atria and ventricle, but they can also be posteriorly, bridging the left atrium and ventricle.

James Fibres — these are thought to be continuations of the internodal pathways that connect the AV node and the sinus node. They bypass the AV node, and terminate in either the common bundle or in the muscle of the interventricular septum.

Septal fibres of Mahaim — These are fibres that can pass from the AV node, the bundle of His, or either of the bundle branches directly to the interventricular septum.

The ECG pattern varies depending on the nature of the accessory pathway. Two major patterns associated with the Wolff-Parkinson-White syndrome are designated A and B. A left sided bundle of Kent which activates the postero-superior portion of the left ventricle first, gives rise to a pattern mimicing that of a right bundle branch block, W-P-W Type A. Conversely, when an impulse travels over an anterior bundle of Kent, the antero-superior portion of the right ventricle is activated first, and the pattern resembles a left bundle branch block, W-P-W Type B.

At the same time, the normal cardiac impulses travel through the AV node and His-Purkinje system, so that the terminal portion of the QRS complex often represents later ventricular activation by way of the normal pathways, and the result is a fusion beat.

If the atrial impulse is transmitted via the James bypass fibres, a short PR interval will result, with a QRS complex of normal duration. Accelerated conduction through the AV node would result in a similar pattern.

If the impulse crosses the AV node, and is diverted by the Mahaim fibres, the PR interval will be normal, but a ventricular complex initiated by a delta wave will result.

Combinations of accessory pathways can be present.

The significance of the accessory pathways lies not in their existence, but in the tendency to develop arrythmias as a result of the pathways. One estimate was that 13.3 percent of these patients develop arrhythmias,[2] but this percentage may be higher. Themost frequent arrhythmias are paroxysmal supraventricular tachycardias, although atrial fibriliation and atrial flutter can also occur. As well, serious ventricular arrhythmias can develop, most frequently in patients with a history of both atrial fibrillation and re-entrant tachycardias, rapid conduction over an accessory pathway during atrial fibrillation, and multiple accessory pathways.[3]

The pre-excitation may come and go. Increased vagal tone delays conduction across the AV node, but has little if any effect on the accessory pathway. For this reason, atropine may normalize the conduction, as can exercise.

Arrhythmias are almost invariably initiated by premature beats in the atria, the AV junction, or the ventricles. Impulses initially travel via the normal pathways, but, on reaching the aberrant pathway, the impulse is transmitted retrograde to the atrium, and initiates a self propagating tachycardia (circus movement). Because antegrade conduction occurs more rapidly over the anomolous pathway, tachyarrhythmias in which conduction takes place to the ventricles via these pathways, can lead to very rapid ventricular response.

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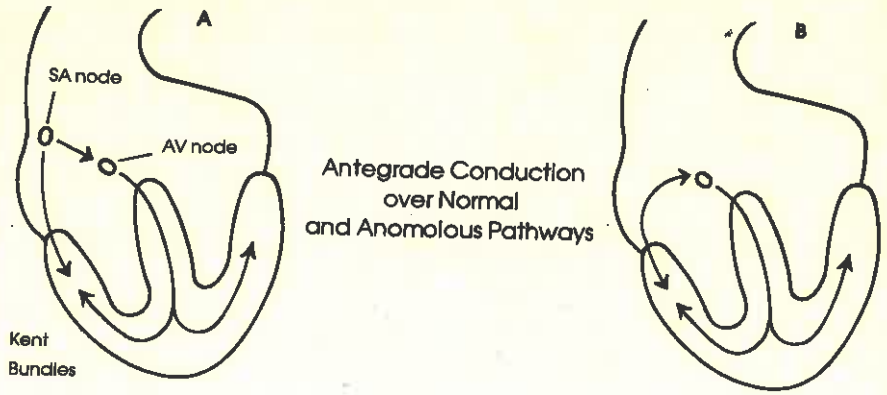

Antegrade Conduction over Normal and Anomolous Pathways

When A occurs the ECG would show the classical pattern of the Wolff-Parkinson-White syndrome

Re-entrant or reciprocating tachycardia. This can be precipitated by any ectopic focus.

See page 10 for ECGs and Case Histories.

Scientific Section

"An Assessment of Single Rescuer BCLS During Ambulance Transport", by H.M. O'Connor, M.D., K.P. Flannigan, M.D.

Abstract

The survival rate of victims of cardiac arrest in various Ontario centers is disturbingly low when compared with sophisticated systems for delivery of prehospital care in the U.S.A. This paper attempts to determine the effectiveness of Basic Cardiac Life Support (BCLS) resuscitation during ambulance transport and it's impact on overall survival rates.

Results show while BCLS performed by an Emergency Medical Care Attendant, Class One (EMCA-1) ambulance attendant in a controlled setting consistently achieves Ontario Heart Foundation (OHF) BCLS training standards, the same cannot be said during transport of a patient model to the hospital. Cycle lengths were unacceptably long and only 38% of all attempted ventilations were acceptable.

It is recognized that prehospital care is a multifaceted problem. Improvement in survival rates of sudden prehospital cardiac arrest in Ontario is contingent on correcting identified deficiencies in the existing system.

Resume

Il est inquiétant de constater le faible pourcentage de survie chez les victimes d'un arrêt cardiaque dans divers centres en Ontario si on le compare à celui qu'on obtient aux États-Unis grâce aux systèmes perfectionnés d'administration de soins pré-hospitaliers. Cet article tente de déterminer l'efficacité des soins immédiats en réanimation cardiaque au cours du transport en ambulance et leur impact sur les pourcentages de survie dans l'ensemble.

Les résultats démontrent que, bien que les soins immédiats en réanimation administrés par un technicien médical d'urgence (technicien ambulancier Classe 1) lors d'une simulation satisfassent régulièrement aux normes de formation de la Ontario Heart Foundation, il n'en va pas de même lors du transport vers l'hôpital d'un mannequin. La durée des cycles était beaucoup trop longue et seulement 38 pour cent des ventilations était acceptable.

Il est reconnu que les soins pré-hospitaliers constituent un problème à multiples facettes. L'amélioration des pourcentages de survie chez les d'victimes arrêts cardiaques soudains pré-hospitaliers en Ontario dépendra de la rectification des lacunes reconnues du présent système.

Key Words

pre-hospital care,
basic cardiac life support,
cardiac arrest

Introduction

An organized sytem of prehospital care is recognized as the essential first link in the delivery of in-hospital medical treatment for victims of cardiac disease and traumatic injury. For over a decade reports from a number of large American centers have relayed impressive records of successful out of hospital resuscitations involving patients in ventricular fibrillation.[1,2] Perhaps the best standard of prehospital care is the programme in Seattle, Washington.[3]

Approximately 40% of the Seattle population has been exposed to public education programs in BCLS. In addition, the Seattle paramedic system boasts rapid response times, with first assistance on scene in under five minutes. In this setting, it is claimed that 28% of victims of prehospital cardiac arrest are discharged from hospital. In those patients who have bystander initiated BCLS, the discharge rate rises to 43%.

In Ontario, there are recognized deficiencies in our prehospital care system. As yet, there has been no integrated public education programme in cardiopulmonary resuscitation. Therefore, bystander initiated BCLS is an infrequent happening. In addition, system access is difficult and often delayed, as most municipalities have yet to introduce the "911" number. And finally, ambulance resuscitative capabilities are limited.

There is at present, no provincial or other standard protocol for evaluation of effectiveness of existing prehopsital care systems. The charts of all prehospital cardiac arrests presenting during 1981 to the Kingston, Ontario Emergency Departments were reviewed. Excluding all charts of patients under three years old, or with associated trauma, or with inadequate chart data, 85 patients had resuscitation attempted in the Emergency Room. Seven patients were resuscitated. All died in hospital within one week. Similarly, in Oshawa Ontario,

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from December, 1978 to December, 1979 fifty patients presented to the hospital in cardiac arrest with BCLS in progress by ambulance attendants. Six patients were resuscitated. All subsequently died in hospital.[4]

Because of the abysmal survival rates demonstrated on chart review; and the authors' concurrent involvement in teaching BCLS, the question arose as to whether BCLS was effective during ambulance transport. This lead to an assessment of one aspect of the prehospital care system in Kingston, Ontario. Through analysis of records of BCLS performed in a patient model, an attempt was made to assess the effectiveness of single rescuer BCLS performed during ambulance transport.

Materials and Methods

Utilized in this study were:

Ten full time EMCA certified ambulance attendants from the Kingston Regional Service; Ministry of Health ambulances, containing standard equipment; and a single recording Resusci-Anne® (Laerdal Medical Corporation).

The study was carried out during hours 1930-2230 during the period July 1st-September 16, 1982. An ambulance crew with attendant designated was dispatched to a city residential address. In **Part A**, the attendant was asked to perform a one minute record of one-man BCLS using mouth to mouth ventilation on the Recording Resusci-Anne®. For **Part B**, a one minute record of one-man BCLS was obtained, using a Flynn® Oxygen ventilator (0-Two Systems of Canada), for ventilation purposes. All attendants were given an adequate period of time for familiarization and choice of face mask, prior to recording Strip B.

Part C was the ambulance run. At the residence, the ambulance crew was told that the mannequin was a 64 year old female with a history of cardiac disease, who had collapsed and was unresponsive. From this point on, with the mannequin continuously recording, the situation was managed as a true arrest. Once the attendant determined absence of vital signs, he was responsible for initiating BCLS, transfer of the patient to the stretcher and then into the ambulance and continuing BCLS during transport to the hospital. The other crew members was instructed to assist in transfer, notify the receiving hospital and drive in a manner appropriate to a cardiac arrest situation.

The route for each run was indentical. It covered a distance of thirteen city blocks, traversing twelve intersections, five sets of traffic lights and involving five 90° turns.

The ambulance run was terminated at the receiving hospital once the mannequin was transferred to a stretcher in the resuscitation room.

Three separate recording strips were obtained from each attendant:

Part A "Control" mouth to mouth – single rescuer BCLS for one minute.

Part B "Control" Flynn® apparatus – single rescuer BCLS using Flynn® oxygen ventilator for one minute.

Part C Continuous recording strip of single rescuer BCLS using Flynn® apparatus from time of identification of cardiac arrest to run termination at receiving hospital.

Each strip was analysed as to acceptability of:

1) Cardiac Compressions: Ontario Heart Foundation (OHF) Performance Standards for BCLS.
2) Total Cycle Length: OHF Standards, maximum cycle length of seventeen seconds.
3) Ventilations: The ventilations for each cycle were considered acceptable if they occurred in pairs and individually exceeded a volume of 500 cc.

Results

Ten ambulance runs were completed. Portions of data from two of the runs were excluded due to deviation from protocol or equipment failure. Results were as follows:

I. **Compressions**
Chest compressions were acceptable for all attendants for Parts A, B and C.

II **Cycle Length**
Each attendant had four cycles to be analysed in each of Parts A & B. During Part C, a mean of 10.7 cycles for each attendant were analysed (range 9-15). The mean cycle lengths for each attendant for Parts A, B & C and the mean cycle lengths for all attendants are presented in TABLE I. These values are illustrated graphically in Figure I. In Part A, the mean cycle length was 16.2 seconds, with six of attendants falling within acceptable range. The mean cycle length for Part B was 19.6 seconds, with only two of eight attendants showing acceptable mean cycle lengths. In Part C, the mean cycle length increased to 21.3 seconds, with all eight attendants showing unacceptable mean cycle lengths.

III **Ventilations**
In both Part A and Part B, we expected to see four pairs of ventilations from each attendant. In Part C a range of 9-15 pairs of ventilations were expected. Results are shown in Table I. In Part A, all ventilations met criteria for acceptability. In Part B of the study, cummulative results from all attendants showed 93.7% of all ventilations were acceptable. In Part C, only 38.4% of all ventilations were considered acceptable. These results are presented graphcially in Figure I.

IV **Other Observations**
With six of the eight attendants, it was noted there were prolonged periods of time ranging from 35-76 seconds where there were no recordable ventilations or

Table I

Mean Cycle Lengths and Percent Acceptable Ventilations During Single Rescuer BCLS

	Part A – Control Mouth to Mouth Single Rescuer BCLS		Part B – Control Flynn® Apparatus Single Rescuer BCLS		Part C – Ambulance Run – Single Rescuer BCLS	
Ambulance Attendant	**Mean Cycle Length** (Seconds)	**Acceptable Ventilations** (%)	**Mean Cycle Length** (Seconds)	**Acceptable Ventilations** (%)	**Mean Cycle Length** (Seconds)	**Acceptable Ventilations** (%)
1	17.8	100	21.3	100	27.1	89
2	16.3	100	20.5	100	20.3	9
3	16.3	100	17.8	50	18.0	18
4	18.7	100	26.2	100	25.8	100
5	14.2	100	20.2	75	20.1	73
6	15.0	100	16.7	100	20.9	20
7	15.7	100	17.7	75	20.1	0
8	15.5	100	16.7	100	18.4	0
Cumulative Mean	16.2	100	19.6	93.7	21.3	38.4
Standard Error	±.49	±0	±1.13	±7.08	±1.17	±14.7

Figure 1A

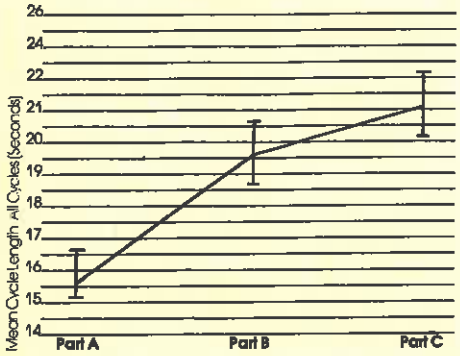
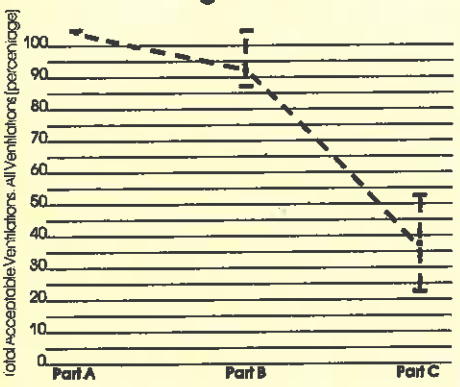


Figure 1B



Standard Error of Mean

Table 2

Transfer of Mannequin from Residence to Ambulance. Period of No Compressions and or No Ventilations During BCLS

Attendant	Absent Compressions (Seconds)	Absence of Ventilations (Seconds)
1	35	65
2	—	—
3	65	80
4	50	35
5	—	35
6	68	68
7	—	75
8	76	—

cardiac compressions. (Table 2) These episodes were seen to occur during transfer of the recording mannequin from the residence to the ambulance.

The relationship was examined between mean cycle length and percentage of acceptable ventilations for each attendant. It was found that in Part C, there was a significant correlation ($R = .81$ $0.05 > p > 0.01$) between mean cycle length and percentage of acceptable ventilations. A significant correlation was not found in Parts A or B. This is discussed in a later section.

Discussion

The results of this study cast serious doubts on the effectiveness of BCLS performed by a single attendant in the back of an ambulance.

This study was designed to reproduce circumstances encountered in the transport of a victim of cardiac arrest to hospital. The Resusci-Anne® mannequin has been thoroughly evaluated and has proven to be a reliable test model for the demonstration of proper ventilation techniques. The compliance of this mannequin averages 0.06 L/cmH_2O, identical to that report for normal humans.[5,6] Our attendants reported no particular problems in achieving a good seal using the face mask. In addition, the Resusci-Anne® has been reported to have the most realistic facial tissue of all training mannequins currently marketed. Finally, all attendants were able to produce acceptable ventilation/compression records in the control situation, using the Flynn® oxygen ventilator. The construction of the study suggests that the demonstrated poor results of BCLS seen during the ambulance run cannot be attributed to the equipment utilized.

The low percentage of acceptable ventilations and the prolonged cycle lengths demonstrated that there are substantial technical problems to be overcome before we can speak confidently about our ability to maintain effective cardiopulmonary resuscitation during the ride to hospital. The negative correlation between mean cycle length and percentage of acceptable ventilations suggests that while BCLS is being performed in an ambulance by a single attendant, adequate ventilation can be obtained only at the expense of greatly prolonged cycle lengths.

Currently in the Province of Ontario, there is not a reliable method of securing or protecting the airway during BCLS. A recent review[7] has shown that 23 of 76 patients (30%) vomited during the performance of BCLS while en route to the hospital. This places a high proportion of these patients at a significant risk for aspiration, while at the same time necessitating substantial further delays in BCLS in order that attempts at airway suctioning be carried out. Securing and protecting the airway must be considered a major obstacle to the provision of optimal prehospital care for victims requiring BCLS.

All reports from the large American urban centers emphasize that BCLS must be initiated within four minutes of collapse, in order to optimize chances of resuscitation. A review of Kingston ambulance records for 1981 showed that vehicles were able to reach a victim of a cardiac arrest occurring within city limits in an average of 5.3 minutes. Recognizing that the incidence of bystander initiated BCLS is very low, local attendants were faced with an arrest victim who was already at high risk for anoxic brain damage.

Statistics currently available show that in this jurisdiction, the record for resuscitation of prehospital cardiac arrest victims is dismal. There are many components to an effective system of prehospital care. Every step in the delivery of a quality system in Ontario must be improved upon. The introduction of a "911" number and a coordinated province-wide public education programme is the first step in improving accessibility to the prehospital system. If response times within that crucial four minutes cannot be assured, then efforts at educating the public will be wasted. Coordinating efforts of the ambulance services branch with those of police and fire departmental personnel would not only improve response times, but may allow a valuable second person to assist in BCLS en route to the hospital.

And finally, the in-ambulance cardiopulmonary resuscitative capability must be critically evaluated and optimal methods for ambulance personnel be identified.

Current methods for airway control and ventilation are inadequate. Intubation is a skill that must be introduced to the Ontario prehospital system, whether it be via oesophageal airway or endotracheal tube. There is an urgent need to have endotracheal intubation reclassified as an EMCA Level II skill rather than Level III.[8] It is conceivable that the province could train the majority of its ambulance personnel to EMCA II Level within two or three years.

In summary, there is a demonstrated requirement to significantly update the performance standards for prehospital care in Ontario. More research and practical experience is needed to ascertain what forms of Basic and Advanced Life Support will best suit the needs of specific regions in Ontario.

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CME Calendar

Trauma Update 1983
Location: Ixtappa, Mexico
Dates: March 26th-April 2nd, 1983
Contact: Steve Antone
Paradise Tours
P.O. Box 2927
Culver City, CA 90232
USA

15 hours CAEP Category I CME credits

Emergencies for Emergency Physicians
Location: Ottawa, Ontario
Dates: February 3rd, 4th, 5th, 1983
Contact: Dr. J.E. Devitt
Director, Continuing Medical Education
University of Ottawa
1053 Carling Avenue
Ottawa, Ontario
K1Y 4E9

Approved 19 hours CAEP Category I CME credits

Core Curriculum Seminars
Location: Ottawa, Ontario
Dates: September 9th, 1982 – Environmental Emergencies

Approved 3 hours CAEP Category I CME credits

October 14th, 1982 – Gastrointestinal Emergencies

Approved 3 hours CAEP Category I CME credits

November 11th, 1982 – Urological Emergencies

Approved 3 hours CAEP Category I CME credits

December 9th, 1982 – Toxicology

Approved 3 hours CAEP Category I CME credits

Advanced Trauma Life Support Course
Location: Regina, Saskatchewan
Dates: November 1982
Contact: Dr. R. Cameron
Plains Health Centre
Regina, Saskatchewan
S4S 5W9

Approved 15 hours CAEP Category I CME credits.

Les Problemes Quotidiens À L'urgence
Location: Montreal, Quebec
Dates: September 24, 1982
Contact: Dr. M. Boucher
Program Director,
Hopital
Maisonneuve-Rosemont,
5415 Boul de L'Assomption,
Montreal, P.Q.

Approved 7 hours CAEP Category I CME credits.

Noticeboard

Emergency Physicians: Summer Locums

Several summer locum positions available for 1983 with well established group of career emergency physicians in Kitchener-Waterloo, Ontario. Good work schedule with generous time off and excellent remuneration. Full multispecialty backup. Must have Ontario licence, CMPA, BCLS, ACLS. Applicants with post-internship training or extensive emergency department experience are preferred, but others are considered. Applications with curriculum vitae and 3 letters of reference to: Dr. Daniel Garrett, Chairman, Emergency Associates of K-W, 835 King St. W., Rm. 315, Kitchener, Ont. N2G 1G3. Tel: (519) 743-3319.

Director Emergency Services

The Brantford General Hospital is seeking a Director of Emergency Services, effective July 1, 1983. The selected candidate will be responsible for administration and teaching within the Department, in addition to patient care.

Applicants should possess or be eligible for a general licence to practice in Ontario, have extensive emergency department experience or be residency trained in Emergency Medicine. Administrative experience is a definite asset.

Brantford is a city of 70,000 in southern Ontario, located one-half hour from Hamilton and one hour from London. The Brantford General Hospital is a 400 bed hospital and provides the only emergency facility in Brantford.

Salary will be commensurate with experience and will include a full line of fringe benefits.

Interested candidates should submit a curriculum vitae to:

Dr. F.J. Baxter
Director of Emergency Services
The Brantford General Hospital
200 Terrace Hill Street
Brantford, Ontario
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Traumatic Rupture of The Diaphragm

Peter L. Lane, M.D.,* Jillene J. McEwen, M.D.†

Abstract

Traumatic rupture of the diaphragm (TRD) with or without herniation is a significant clinical entity. The severity of intermediate and long term complications correlates positively with how soon the diagnosis is made.

A study was undertaken to define the incidence of TRD in a Canadian Trauma Unit, to identify the frequency and location of herniation and to review the clinical presentation and x-ray findings in the emergency department. Data collected prospectively on 900 patients admitted to the Regional Trauma Unit were reviewed. 25 cases of TRD were identified and analyzed (2.8% of admission). 23 cases resulted from blunt truncal trauma, 2 from penetrating trauma. 20 cases were associted with herniation. The clinical presentation, associated injuries, x-ray findings complications and outcome of these patients were analyzed. These results are compared with other published reports.

Résumé

La rupture traumatique du diaphragme avec ou sans hernie constitue un problème clinique important. La gravité des complications à moyen ou à long terme est directement reliée au momer où le diagnostic est établi.

Cette étude fut entreprise dans le but de définir le pourcentage de ruptures traumatiques du diaphragme rencontrées dans un Centre canadien de traumatologie, d'identifier la fréquence et la localisation de la hernie et de revoir les observations cliniques et les constatations radiographiques effectuées à l'urgence. On a revu les données d'une étude prospective de 900 malades admis au Centre de Traumatologie Régional. Vingt-cinq cas de ruptur traumatique du diaphragme furent identifiés et analysés (2,8 pour cent d'admission). Vingt-trois cas résultaient d'un traumatisme fermé du tronc, deux d'une plaie pénétrante. Vingt cas s'accompagnaient d'une hernie. Les observations cliniques, les blessures associées, les constatations radiographiques, les complications et le devenir de ces malades furent analysés. Ces résultats sont comparés à d'autres rapports publiés sur le sujet.

Key words
Trauma, rupture of the diaphragm, diaphragmatic hernia, chest trauma.

Introduction

Traumatic rupture of the diaphragm (TRD) is an uncommon, but significant injury. Most published reports estimate an incidence of 3% of multiply injured patient.[1,2] However reports in the literature usually refer to patients admitted to British or American Trauma Units and few studies utilize quantitative injury scoring to allow accurate cross-study comparisons.

The objectives of the present study were: to more clearly define the incidence of TRD in a Canadian trauma unit, with its predominance of blunt abdominal trauma; to define the frequency of herniation and of left-sided vs. right-sided TRD; to review the clinical and radiographic features of TRD as it presents in the Emergency Department; and to tabulate and analyze associated injuries, using quantitative scoring. These results were then compared to other published reports of TRD.

Materials and Method

Since commencing operations in June 1976, the Regional Trauma Unit at Sunnybrook Medical Centre in Toronto has collected data prospectively on all patients admitted (patients with Injury Severity Scores[3,4] < 16 are excluded from further consideration). Data from the first 900 such patients were reviewed, and 25 cases of TRD were identified. The Trauma Unit charts of these patients were then reviewed, and the data abstracted included: age, sex clinical findings on presentation, x-ray findings, surgical findings and procedures, complications, outcomes, and Injury Severity Score[3,4] (ISS).

The Regional Trauma Unit currently treats 300-400 patients per year. It is located in Toronto, Canada, with a population of 2.1 M. 85% of admissions are referred from other hospitals, both within and beyond the boundaries of Metropolitan Toronto.[5] Contrary to experience in American Trauma Units, the overwhelming majority of patients at Sunnybrook have suffered blunt vehicular trauma, with less than 10% of total admissions resulting from penetrating injuries.

The Emergency Department management of such patients is

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conducted by the Trauma Team, which is comprised of a team leader (emergency physician, staff anaesthetist or orthopedic surgeon) senior residents in anaesthesia, general surgery, orthopedic surgery and neurosurgery, two circulating nurses, one charting nurse, a respiratory technologist, and an x-ray technologist.[5] All investigations and therapeutic interventions are ordered by, or in consultation with the team leader. The team is responsible for the care of the patient from the time of arrival until the patient is transferred to the operating room, ward, or intensive care unit.

Results

Of 900 consecutive admissions reviewed, 25 patients had TRD or 2.8% of admissions. 20/25 or 80% suffered associated herniation, while 5 were simple tears of the diaphragm.

There was a slight male predominance, 15/25 male, 10/25 female. The overall mean age was 37, the female mean was 44 years of age, while the male mean age was 32.

The mechanism of injury was blunt trauma in 23 patients. Of these, 20 involved motor vehicles including one pedestrian and one cyclist, each struck by cars. One patient suffered a fall from a height, while two had major truncal crush injuries, one from a farming accident and one industrial accident. Of the two penetrating injuries, both were stabbings, one self-inflicted.

The incidence of various associated injuries is tabulated in Table I. There is a predominance of associated truncal injuries when compared to the entire trauma unit population.

The initial presentation of these patients was evaluated in some depth, to more clearly define the early clinical and radiographic findings for the emergency physician. Table II lists the clinical findings on presentation. Data was only available for 20/25. Only 13/20 had *any* abdominal findings on presentation — tenderness, guarding or decreased bowel sounds. Three patients had completely normal examinations.

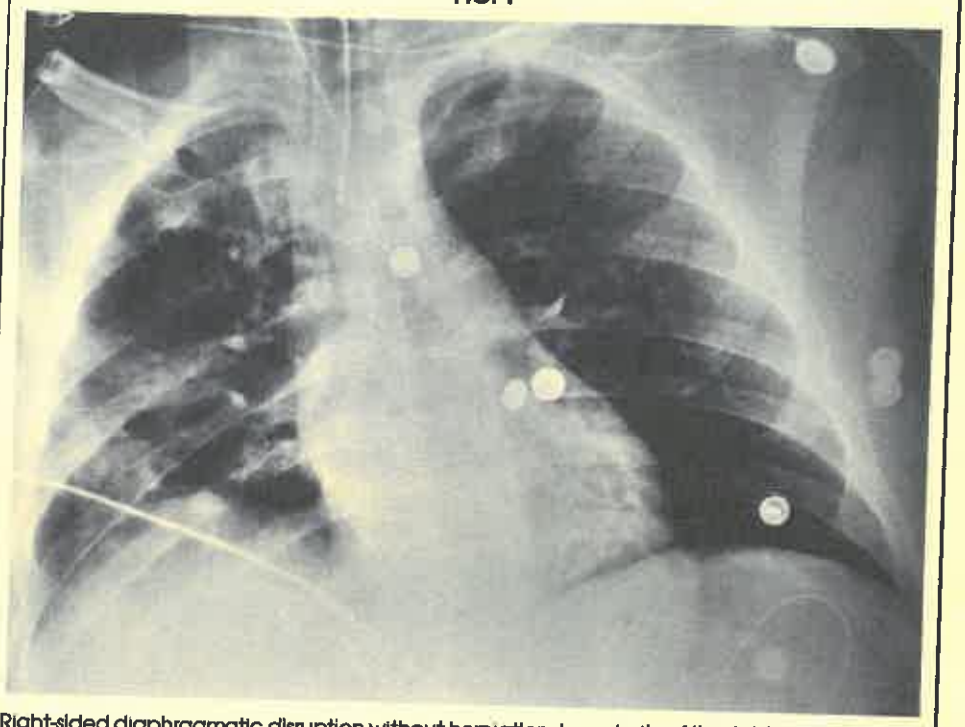
Table III lists the initial and later radiographics findings of these patients. Since 2 patients were essentially dead on arrival, findings are listed on only 23.

Table I

Associated Injuries in Blunt TRD (23 Cases)

Rib fractures	12 (52%)
Hemopneumothorax	11 (48%)
Ruptured spleen	10 (43%)
Fractured pelvis	9 (39%)
Significant CNS injury	8 (35%)
Lacerated liver	7 (30%)
Extremity fractures	4 (17%)
Facial fractures	4 (17%)
Lung contusion (x-ray)	4 (17%)
Urogential injuries	3 (13%)
Ruptured thoracic aorta	1 (4%)

FIG. 1



Right-sided diaphragmatic disruption without herniation. Irregularity of the right hemidiaphragm and pulmonary contusion can be seen.

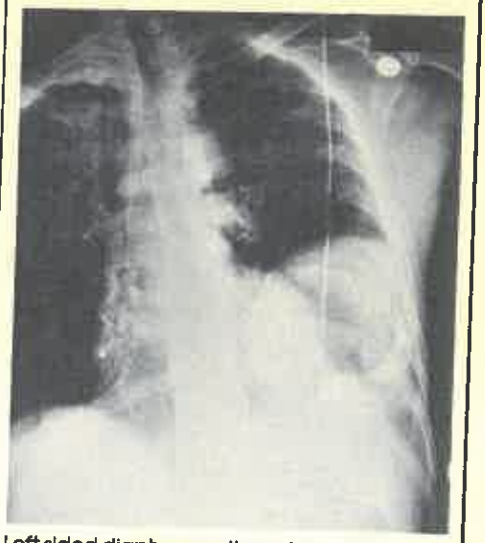
As can be seen from the table, 8/23 (35%) had no findings on their initial films in the Emergency Department, and 3/23 patients never had any radiographic findings. In all three of these patients, the TRD was a simple tear without herniation. In addition, the one patient with an irregular diaphragmatic shadow originally (see Table III) had a simple tear (Fig. 1).

Herniation was present in 20/25 (80%) patients. This was left sided in 16 patients, right sided in 3, bilateral in 1. In addition to the radiologic finding of air bubbles, suggesting bowel in the chest, some of the patients with herniation demonstrated a variety of other findings including plate-like atelectasis, mediastinal shift, elevation or obscuration of the hemidiaphragm and a retrocardiac opacity (Fig. 2 & 3).

As noted, 2/25 patients died essentially upon arrival. The other 23 patients had surgical repair performed. 18 (78%) of these were performed within 12 hours of injury, and surgery was delayed from 2 to 19 days in the other 5. Lacerations ranged from 2 (penetrating injury) to 20 cm., with an average of 8.5 cm. Tears ran in many directions, but were most common in the left postero-lateral area. Of the 23 injuries as a result of blunt trauma, 17 were left sided, 3 right sided and 3 bilateral.

Post-operative complications were limited to the abdomen and the chest,

FIG. 2



Left sided diaphragmatic rupture with herniation of the stomach. Some mediastinal shift to the right is present. (The tear was ~ 7 cm. long).

Table II

Initial Presentation (only available for 20/25)

Abnormal Abdominal exam	13/20 (65%)
Decreased air entry	9/20 (45%)
Bowel sounds in chest	2/20 (10%)
No signs in abdomen or chest	3/20 (15%)

Table III

Radiographic Findings (23/25 – 2 DOA)

Abdominal organs in chest	14/23 (61%)
Irregular diaphragmatic shadow	1/23 (4%)
∴ Evident on first x-ray	15/23 (65%)
Herniation on subsequent x-rays	5/23 (22%)
No findings	3/23 (13%)

Table IV

Complications Post-Operatively

Respiratory Failure	3
Recurrent Pneumothorax	1
Recurrent Pneumonia	1
Pleural Effusion	1
Subphrenic abscess	1
Non-specific G.I. symptoms	2
Delayed peritonitis	1
	10/23 = 43%

and occurred in 10/23 patients (43%) (Table IV).

Of the 25 patients, the average ISS was 40. 20 survived to discharge, with an average ISS of 33. 5 patients died, with an average ISS of 65. Of those that died, two died essentially on arrival, one during the immediate post-operative period (8 hours post injury), one at 14 and one at 18 days post injury. Post mortem reports and mortality reviews of all 5 deaths agree that death was a consequence primarily of major CNS injury, and had little of anything to do with the TRD.

Discussion

Diaphragmatic rupture was apparently reported at autopsy by Sennertus in 1841,[6,7] while the first ante mortem diagnosis was reported by Bowditch in 1853.[8] In 1886, Riolfio is generally acknowledged to have performed the first surgical repair of a tear resulting from a penetrating injury,[9,10] while Walker reduced and repaired a herniation resulting from blunt trauma.[11]

Diaphragmatic rupture may be traumatic, or spontaneous. Traumatic rupture from penetrating causes, while rare in this study, does occur. Tears tend to be small, typically less than 2 cm. and rarely associated with herniation.[12] TRD resulting from sudden thoracic or abdominal compression — the seat belt or steering wheel injury —tends to produce larger tears, often 10 cm. or more, with herniation.

A few reports exist of "spontaneous" TRD, following severe coughing or associated with pregnancy. These are extremely rare however.[13,14]

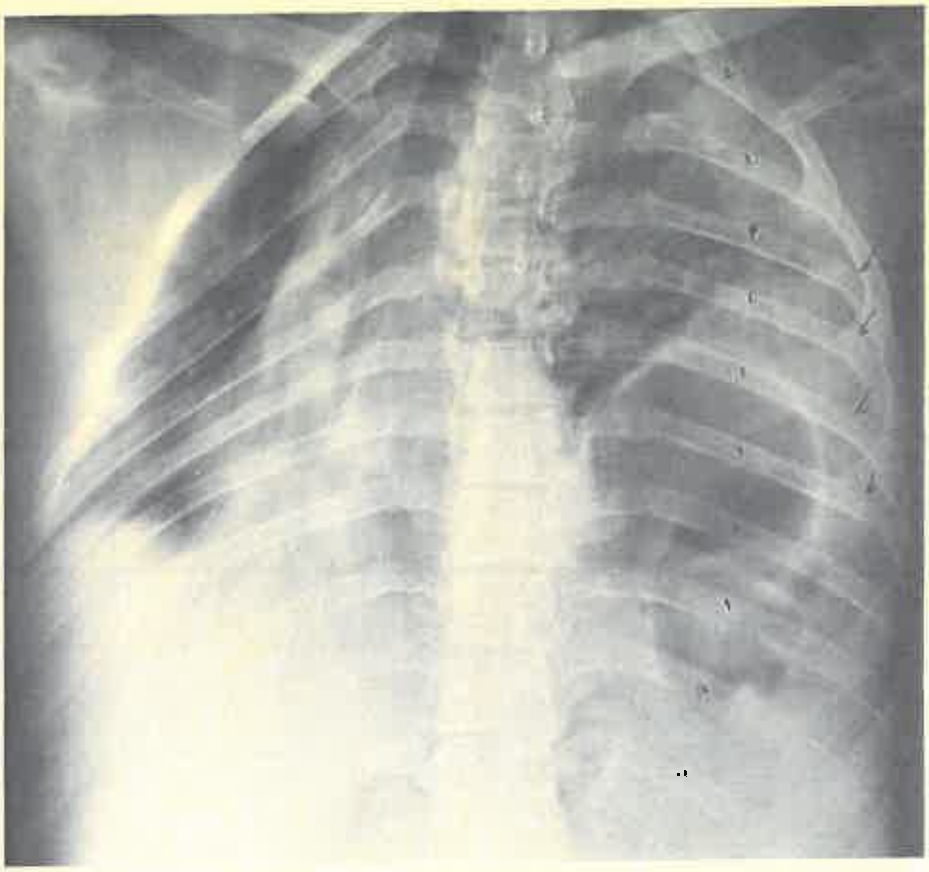
Establishing a meaningful figure for the incidence of TRD is particularly problematic. Some authors consider jus herniations, others restrict consideration soley to victims of blunt trauma. As previously noted, penetrating TRD with a small tear is much more common than TRD resulting from blunt trauma in the United States. The fact that only 2 of 25 patients in this study suffered penetrating trauma is at marked variance with other studies.[15-19]

Wise[18] reviewed 110 cases presenting in St. Louis, Missouri, USA hospitals. 25 of these were from blunt trauma, while 85 were as a result of penetrating injuries, 59 gunshot wounds and 26 stabbings. Similarly Esterera[16] reviewed 66 cases, 4 penetrating and 23 blunt trauma induced.

Another problem in defining incidence is the denominator or total patient population to be considered. Should a trauma patients be considered, including minor trauma, isolated head or extremity trauma, etc.? The most meaningful figures would appear to be an overall incidence/100,000 population, as well as that among patients with major blunt truncal trauma. Estrera[16] showed that 5.2% of patients who arrived dead on arrival with blunt abdominal trauma had TRD. In the present study, 2.8% of all trauma unit patients (ISS > 15) had TRD. When one considers only blunt truncal trauma 6.1% of all trauma unit patients with truncal injuries had TRD.

The frequency of right-sided ruptures with blunt trauma has varied greatly. Hedblom[20] originally suggested that only 5% of ruptures were right-sided, but others quote higher figures.[10,21,22,23] Brooks[24] found a 10% incidence, Meads[25] 6/20 patients, and Bryer[15] 5/ The present study showed 3/23 right-sided ruptures while another 3 were bilateral. As others have speculated, the liver would appear to afford significant protection against right-sided TRD. Although none were noted here, several reports exist of an

FIG. 3



Left-sided diaphragmatic rupture with herniation of the stomach. Trachea and mediastinum are markedly shifted to the right. Numerous rib fractures are present. There is patchy consolidation of the left lung. The tear was found to be ~ 20 cm. long.

intrapericardial herniation as a result of TRD.[26,27]

Tears usually occur in the left postero-central area and extend medially.[28] Regarding the location of tears, a variety of hypothesis have been put forward. Lucido and Wall[2] suggested that tears occur at points of the embryonic fusion of the left postero-lateral leaflet. An interesting observation was that of Andrus and Morton,[21] who noted 2-3 mm. fatty separations between radial muscle fibers in the diaphragms of 4 of 10 cadavers. Whether these "fault" lines play any role in the etiology is unclear.

The predominance of herniations over simple tears in this study is characteristic of most reports. Presumably, the relatively negative intra-thoracic pressure facilitates herniation of intra-abdominal contents into the chest.[30] Herniation of lung has been reported[22] although it was not observed here.

Assessments of outcome have been difficult to compare between studies. In the present study, the Abbreviated Injury Score[3] (AIS) and its derivation, the Injury Severity Score[4] have been used. This scoring system, developed by Baker et al[3] and promoted by the American Association for Automotive Medicine has, in the 1980's, become the "language of trauma". By identifying the average and range of ISS for patients populations in groups being studied, comparisons can be made. Of the group studied here, the average ISS overall of 40 is very high indeed. The average ISS of 33 for the survivors is also indicative of the fact that in general these patients have severe multiple system injuries associated with significant risk of mortality. The average ISS of 65 of the deaths in this study is much higher than the overall average ISS for deaths in the Trauma Unit, as recently shown by Wright and McMurtry.[31] In light of this, as well as the conclusions of the pathologists who performed the post mortem examinations, it is concluded that TRD had no effect on mortality. All patients who died had major CNS trauma.

As noted, it is difficult to make cross-study comparisons without the ISS. Others have attempted to tabulate lists of associated injuries. Of interest among these is the predominance of abdominal vs. thoracic injuries.[6,15,21,32] That was not the case in this study, as shown by Table I. The only explanation as to why these patients had a relatively higher incidence of chest injuries that can be offered is that for the duration of the period studied, legislation requiring three point restraint systems was in effect.

While TRD may have little impact on mortality, it does have an impact on morbidity. Table IV indicates the variety of complications which were present post-operatively in 43% of the patients. These all of course contributed to prolonged length of hospital stay, more days on ventilators, and increased utilization of a wide range of resources.

In 1951, Carter et al[33] proposed a clinical staging system that has subsequently been used by some. Carter's three stages, associated with increasingly poorer prognoses are as follows: 1) *immediate phase* — diagnosis is made early, upon initial presentation; 2) *latent phase* — diagnosis is delayed days or even years, and is found as an incidental finding or as a result of minor symptoms; 3) *strangulation phase* — diagnosis is made as a result of the patient presenting with an acute abdomen arising from strangulation of the herniated abdominal organs. A number of authors since have simplified this staging to simply early and delayed phases.[34,35,36] Whatever the precise staging system used, there is agreement that delayed diagnosis leads to increased complications. In the present study, however, there was not a significantly higher rate of complication among the patients with delayed diagnosis.

The clinical presentation of TRD in the emergency department is most variable. In the present study, only 65% had abnormal abdominal examinations. In several, this was as minimal as non-localized tenderness. The often quoted finding of bowel sounds in the chest was present in only 10%, while 15% of patients had no abnormal findings referrable to abdomen or chest.

The presence and severity of findings on initial presentation depends on a variety of factors. If the patient is awake on presentation and has had no significant alcohol intake and no major head or spinal cord injury (representing less than 25% of trauma patients, after these exclusions) they may complain of dyspnea, abdominal, chest or shoulder tip pain, but this is rarely helpful. Herniations, particularly large ones, may present more dramatic findings including immobility of the left chest, cyanosis, mediastinal shift, bowel sounds in the chest and decreased air entry. Again, however, herniations that large are the exception rather than the rule.

If the diagnosis of TRD is to be made early, it is usually made on the basis of early x-ray changes confirming clinical suspicion. In this study, 65% of patients had positive findings on the initial chest x-ray. These patients demonstrated either abdominal viscera in the chest or an irregular diaphragmatic shadow. Carter[38] described 1) an arch-like shadow resembling an abnormally high diaphragm; 2) extraneous shadows such as gas bubbles or solid viscera above the level of the diaphragm; 3) mediastinal shift; and 4) disc-like atelectasis above the arch-like shadow. Other authors have pointed to signs such as the presence of the naso-gastric tube in the chest,[33] and the description of a loculated pneumothorax.[37,38]

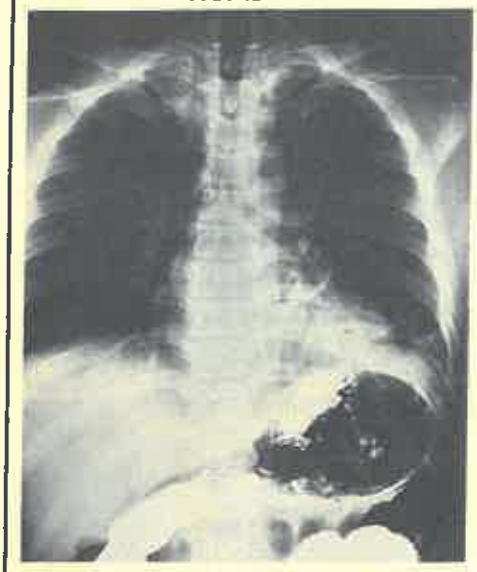
FIG. 4A

Chest film taken 1 week post abdominal stabbing. The initial chest film was normal. Here, there is loss of the left hemidiaphragm and air bubbles above the expected level of the diaphragm to confirm diaphragmatic disruption. A barium contrast study was performed. See Fig. 4B.

Right-sided TRD may be particularly difficult to identify on early x-rays, in part because the liver may prevent herniation. If present, herniation may involve part of the liver, giving a mushroom-like projection; all of the liver, giving a high smooth arcuate shadow;[39] or liver as well as other viscera an irregular shadow in the right chest.

TRD without herniation results in subtle, if any, radiologic findings. Minagi, Brody, and Laing[40] drew attention to the importance of diaphragmatic contour

FIG. 4B



Barium contrast study of the same patient in Fig. 4A shows clearly a small left central diaphragmatic hernia involving the gastric fundus.

— irregularity, lobulation or varying degrees of elevation.

A variety of other radiographic techniques have been described. In the present study, one case with a small tear had subtle findings on a plain chest film that showed an obvious herniation after a barium swallow (Fig. 4A & B). Injection of air or contrast medium into the abdominal cavity is described,[24,41,42] but not recommended by the current authors. Fluroscopy, ultrasound, isotope and CT scanning may all be of some help.[12,17,43,44]

Peritoneal lavage is a controversial aid to diagnosis of TRD. Freeman and Fischer, (1975)[45] felt it to be of little help, whereas a more recent study suggests the opposite.[46] All patients admitted to the Trauma Unit with head, cord and truncal trauma had open peritoneal lavage performed. However, all patients with positive lavage results had additional intra-abdominal pathology to account for this. The five patients with delayed-diagnosis of TRD had initially negative lavage results.

Complications arising from TRD here, as elsewhere, have tended to be limited to chest and abdomen as shown in Table IV. The rate of 43% overall is similar to others reported.

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Guest Editorial

CAEP and the Nuclear Arms Race

by Eric Letovsky, M.D.

The world gave birth to the nuclear age on August 6th, 1945. On that day a very primitive bomb containing Canadian uranium and an explosive power of 13 kilotons of TNT was dropped on Hiroshima, instantly killing 75,000 people and injuring another 100,000 people. Of Hiroshima's 45 hospitals, only 3 were left unscathed and only 30 doctors and 126 nurses survived to assist in medical care.[1] Those people not killed outright by the blast were the first to experience acute radiation poisoning — anorexia, nausea, vomiting, diarrhea, alopecia, spontaneous bleeding and increased susceptibility to infection. Radiation effects persisted decades later in the forms of increased leukemia, breast, lung and thyroid cancer.

Since that time, the world has observed the nuclear monster grow up with some ominous characteristics. Firstly, there has been a tremendous buildup in the arsenal of nuclear weapons. Presently the United States and Russia possess more than 40,000 such weapons[2], with an explosive potential of over 15,000 megatons (i.e. 15,000 million tons) of TNT — which works out to 5 tons of TNT for every man, woman and child on the planet. Remembering that even a single megaton bomb can deliver an explosion more than 70 times bigger than that which destroyed Hiroshima, (and there are bombs of 50 megaton size), one can begin to sense the unfathomable potential for human death and destruction these weapons possess.

Secondly, there has been a trend on both sides to develop first-strike weapons, more suitable for provoking rather than deterring nuclear war.

Thirdly, there is an increasing reliance on early warning computer systems to detect, analyze and respond to an enemy attack. On our side alone however, the North American Defense Command reported 151 computer false alarms in an 18 month period.[3] One had American forces on alert for a full 6 minutes before the error was discovered. Missiles cannot be recalled if launched by mistake. Clearly, the risk of accidental nuclear war is unacceptably high, and increasing, because of human and electronic fallibility.

With the termination of detente, the danger of a nuclear exchange between the two great superpowers has greatly increased. Recent American plans to increase their nuclear stockpile and proceed with the deployment of the Cruise, Pershing and MX Missiles will undoubtably be matched by a corresponding increase in the Russian nuclear arsenal. History has demonstrated time and time again that peace cannot be promoted by the preparation of war. The arms race, while intended on all sides to promote security has on the contrary increased world insecurity and brought the world closer to the edge of a major catastrophe. An all-out war between the superpowers is expected to produce 140 million deaths in the United States, and 110 million deaths in the Soviet Union.[4] Because the eastern seaboard is so heavily populated and would bear the brunt of the attack, all our Canadian cities close to the border would share in the devastation.

The medical consequences of thermonuclear war were first described in 1962 in the New England Journal of Medicine,[5] and more recently elucidated in Scientific American,[6] among other journals.[7,8] Even a single megaton nuclear weapon detonated over Toronto would have catastrophic consequences. It is estimated that such a blast would kill 624,000 (25%) outright and seriously injure another 800,000 people (32%).[9] Victims would suffer from massive 2° and 3° burns, shock, crush injuries, skull fractures, perforated viscera as well as the effects of nuclear radiation. It is thought that 65-80% of all hospital beds would be destroyed and that there might be one doctor left for every 1,700 patients. Given the total disruption of the health care system, the lack of electric power, communication, transportation, essential medical equipment and supplies, it is easy to see that any of us who survived would be rendered useless.

The longer range effects would be equally devastating. These include radioactive contamination of the food chain, climatic changes and rampant disease given the thousands of corpses and unavailability of antibiotics and medical services.[10]

And even if nuclear war were never fought, what about the human costs of the arms race? Last year over $500 billion was spent on the arms race, or $1 million a minute. Contrast that with the fact that smallpox was eradicated for the price of one strategic bomber. The World Health Organization's campaign for the next ten years, to eliminate disease contaminated water (the source of an estimated 80% of the sickness of the world) has a budget equal to three weeks of the arms race. Even a small fraction of what is now being spent on arms could be used to provide adequate food, clear water and adequate health care facilities for the entire world.

Clearly, the arms race poses the greatest threat to public health that our civilization has ever known. As acute care physicians, perhaps we can realize even more than others, that a nuclear exchange of any magnitude would have intolerable consequences, both immediate and long term. As individuals dedicated to curing disease and the preservation of life, we have a moral responsibility to practice the ultimate in preventive medicine and work towards avoiding the nuclear holocaust which the world appears to be moving. Numerous physicians are already active in this formidable task. Physicians for Social Responsibility boasts a membership of 30,000 in the United

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Dr. Eric Letovsky, Staff Physician, Division of Emergency Services, Mount Sinai Hospital, Toronto, Ontario. Vice President and Secretary, Physicians for Social Responsibility, Canada

States and over 700 in Canada, who are working to inform and educate the public and those concerned with public policy the medical implications of the nuclear arms race. Several conferences have been held in major Canadian cities on the subject and a number of medical associations have passed resolutions condemning nuclear weapons.

The Canadian Association of Emergency Physicians should use its knowledge and influence to help strenthen the movement of physicians for the prevention of nuclear war. Our silence and failure to act only allows the arms race to continue, making inevitable what would surely be humanity's final epidemic.

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Meetings to note

A.T.L.S. Providers — London

Dates: Feb. 24-26, 1983
April 21-23, 1983

Contact: Dr. Rocco Gerace
Department of Emergency Medicine, Victoria Hospital, 391 South St., London, Ontario N6A 4G5
(519) 432-2352

Advanced Trauma Life Support Courses

Sponsored by the Programme in Continuing Medical Education and Emergency Medicine Department, Faculty of Health Sciences, McMaster University.

Dates: Monday and Tuesday, December 6 & 7, 1982; and Saturday and Sunday, April 23 & 24, 1983

Location: Health Sciences Centre, McMaster University, Hamilton, Ontario

New Brunswick Emergency Physicians Association

Sat., Dec. 11th at 9:30 AM, Saint John Regional Hospital. All day scientific session on Neurology and Neurosurgery plus business meeting afterwards. CAEP credits applied for. Meetings every 3-4 mos. Further information: Dr. Derik Jones, Saint John Regional Hospital, Saint John, N.B. Scientific sessions open to all interested physicians and critical care nurses. Sessions will rotate from Saint John to Moncton to Fredericton.

Fourth Annual Postgraduate Course in Emergency Medicine

Sponsored by: Emergency Section Hamilton Academy of Medicine and Programme in Continuing Medical Education McMaster University.

Date: April 17-22, 1983

Location: Health Sciences Centre, McMaster University Hamilton, Ontario

For further info: Contact Mrs. Beverly Woods, Registration Clerk, Continuing Medical Education, Room IM6, McMaster University Health Sciences Centre, 1200 Main St. West, Hamilton, Ontario L8S 4J9 (416) 525-9140 Ext. 2219 or 2223

Medical Director Emergency Department

The Plains Health Centre, a division of the South Saskatchewan Hospital Centre is a 300-bed fully accredited teaching hospital of the University of Saskatchewan.

The incumbent will be responsible for the administration of the department, the undergraduate and postgraduate educational program as well as clinical responsibilities including carrying out reviews related to the quality of care provided in the department.

Applicants must be eligible for or fully licensed to practise medicine in the province of Saskatchewan. Preference will be given to applicants with postgraduate training in Emergency Medicine, Royal College Certificants and College of Family Medicine Certificants. Previous Emergency Department experience is a requirement. The successful applicant will be appointed to the University of Saskatchewan teaching faculty.

In addition to an attractive salary range, we offer fringe benefits such as Group Life Insurance, Disability Income Plan, Pension Plan, as well as numerous other benefits.

Reply to:

Mr. D. Schurman,
Administrator,
Plains Health Centre Division,
South Saskatchewan
Hospital Centre,
4500 Wascana Parkway,
Regina, Sask. S4S 5W9.

—3872

South Saskatchewan Hospital Centre

Emergency Medical Training Programmes

RCPS

Kingston, Ontario

Hospitals Kingston General Hospital, Hotel Dieu Hospital

University Queen's

Programme Director Dr. L. E. Dagnone, Emergency Dept., Hotel Dieu Hospital, Kingston, Ontario, K7L 3H6

Length of Programme 4 yr post-M.D. or 3 yr post internship

Size maximum of four (4) residents per year.

Accreditation RCPS (pending)

Toronto, Ontario

Hospitals Toronto General, Sunnybrook Medical Centre, Hospital for Sick Children

University of Toronto

Length of Programme four (4) yr after graduation, three (3) yr after rotating internship.

Size 3 residents per year.

Accreditation RCPS(C) (pending)

Programme Director Dr. Bruce Rowat, Director of Emergency Department, Toronto General Hospital, 101 College St., Toronto, Ont. M5G 1L7

Deadline for applications: Oct. 1 of each preceding year.

Montreal, Quebec

University McGill University

Hospital Royal Victoria Hospital Emergency Department

Program Director Dr. Wayne Smith, 687 Pine Avenue West, Montreal, Quebec H3A 1A1

Length of Programme 3 years

Prerequisites at least 1 year mixed or rotating internship

Number of Residents Accepted per year: 4 residents

Deadline for applications October 30, 1983

Accreditations: RCPS(C) (pending)

Calgary, Alberta

University of Calgary

Hospital Affiliation Foothills Hospital, Alberta Children's Hospital

Programme Director R. Abernethy, Div. Emergency Medicine, Foothills Hospital, 1403-29th Street N.W., Calgary, Alberta T2N 2T9

Number of residents accepted per year: one

Length of Program: 3 yr post internship

Deadline for application: Oct. 30

Accreditation: RCPS(C) (pending)

CFPC

Toronto, Ontario

Hospitals Toronto Western, Sunnybrook Medical Centre, Hospital for Sick Children

University of Toronto, Department of Emergency Medicine & Family/ Community Medicine

Program Director Dr. Calvin Gutkin, Toronto Western Hospital, c/o 751 Dundas Street West, Toronto, Ont. M6J 1T9

Length of Program A three (3) year post M.D. program, the 1st two (2) years of which meet the requirements of the Department of Family & Community Medicine and a 3rd year structured in Emergency Medicine

Number of positions – three – third year positions available

Accreditation The Special Certificate of Competence in Emergency Medicine will be awarded to those residents successfully completing the Emergency Certification Examination of the College of Family Physicians of Canada.

Deadline for application Oct. 15 1983 for 1984-85 year)

Hamilton, Ontario

University McMaster University

Hospital Chedoke/McMaster Hospitals, St. Joseph's Hospital, Hamilton Civic Hospitals, affiliated to the Department of Family Medicine.

Programme Director Dr. David Maxwell, McMaster Hospital Emergency Department, 1200 Main Street West, Hamilton, Ontario L8N 3Z5

Length of Programme 3 year post M.D. integrated programme with both Family Medicine and Emergency Medicine, or free-standing 3rd. year post CCFP. Candicates may enter at 1st., 2nd., or 3rd. postgraduate year levels.

Accreditation: CFPC (pending)

Deadline for applications; Nov. 30, 1983 for 1984 physicians.

Ottawa, Ontario

University Ottawa

Hospitals Ottawa Civic Hospital, Ottawa General Hospital, Children's Hospital of Eastern Ontario

Programme Director Dr. A. F. Henry, Chief, Emergency Dept., Ottawa Civic Hospital, 1053 Carling Avenue, Ottawa, Ontario K1Y 4E9

Length of Programme 3 years post M.D., first two years as a trainee in the Family Medicine Program, leading to CCFP and third year in Emergency Medicine. The third year is also open to practising physicians.

Size 4 residents per year

Accreditation provided by CFPC. Trainees eligible to write Certificate of Emergency Medicine exam of CFPC.

Deadline for Applications: September 30.

Calgary, Alberta

University of Calgary

Hospital Affiliation Foothills Hospital, Alberta Children's Hospital

Programme Director R. Abernethy, Div. Emergency Medicine, Foothills, Hospital, 1403-29th N.W. Calgary, Alberta T2N 2T9

Length of Program: one year post CCFP

Number of residents per year: two

Deadline for applications: Oct. 30