Trauma and Orthopedics

Etiology, Diagnosis and Management

aims to serve as a valuable handbook for the readers seeking answers to sticky questions about trauma and orthopedics. Though written primarily for medical students, medical officers and others, especially those working as a team in the department of trauma and orthopedics, it will also prove invaluable to medical practitioners, emergency and critical care area nurses, and paramedics. This text can provide reassurance in moments of uncertainty.

An attempt has been made to discuss trauma emergencies in the trauma section, particularly injuries to the upper limb, lower limb and the spine, and common orthopedic disorders in the elective orthopedic section.

In polytrauma cases, the orthopedic part of the patient's care is coordinated (triage) with other surgical specialties as appropriate in the department of accident and emergency or as an outpatient in a fracture clinic.

The contents of this book are presented in three parts:

I. Surgical Trauma
II. Orthopedic Trauma
III. Elective Orthopedics

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Conversion system has been adopted while mentioning medicine doses, e.g. No. of days, weeks, months, in order to save space.

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to

the memory of
my father

Preface

This book has been written primarily for the medical student, medical officers and others, especially those working as a team in the department of trauma and orthopedics (T&O). Orthopedic trauma includes fractures and dislocations as well as musculoskeletal injuries to soft tissues including muscles, ligaments, tendons and nerves. Orthopedic trauma particularlly includes injuries to the upper limb (shoulder to hand), lower limb (hip to foot) and the spine. Orthopedic surgeons generally do not deal with injuries to the head, chest, abdomen and blood vessels. In case of a polytrauma patient, mostly caused by high velocity injuries like motor vehicle collisions or fall from a height, the orthopedic part of the patient's care is coordinated with other surgical specialties as appropriate usually in the department of A&E. Orthopedic trauma patients usually admitted via the department of A&E (emergency) or examined as an outpatient in a fracture clinic.

This book is intended to serve as a useful reference, on widely accepted techniques currently available for finding causes, clinical diagnosis, investigations, and management of acute trauma cases, and other common disorders. The contents of this book are presented as separate sections, anyone of which is complete in itself, for example management of trauma/disorders has been described fully — initial emergency treatment by the A&E staff, followed by further definitive treatment provided with the help of referred specialists in the department of T&O, depending on the infrastructure of the hospital.

Specific references are included as a guide to further study. Evaluation of new surgical/nonsurgical concepts and advances in determining causes, diagnosis, investigation and treatment has been a constant challenge. Orthopedics progress and space limitations are the deciding factors.

This book aims to guide the orthopedic surgeon who treats the patient in the A&E or T&O department or in a fracture clinic, on how to keep adequate records of history, physical examination, investigation, and management of cases. An attempt has been made to mention the trauma emergencies in the trauma section, and at the same time make mention of common orthopedic disorders in the orthopedic (elective) section, for which the patients visit the department of A&E, T&O and fracture clinic for consultation and treatment. Special mention has been made about examination and management of trauma cases on priority basis, especially while dealing with polytrauma emergencies.

Special chapters on management of fractures and dislocations, common orthopedic disorders are intended to serve as medically-oriented discussions of these fields with important clinical implications for the patient's care.

I have endeavored throughout to mention the authorities whose works I have made use of, but I should like to express here my appreciation of the fact that it is the work of others which gives this book any value it may have.

PS Kapoor

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PS Kapoor

Contents

Abbreviations

A&E	Accident and emergency
Ab	Antibody
ABC	Airway, breathing, circulation
ABG	Arterial blood gases
ACE	Angiotensin-converting enzyme
ACLS	Advanced cardiac life support
ACTH	Adrenocorticotropic hormone
AKPOP	Above knee Plaster of Paris
A-O (ASIF)	Association for the study of Internal Fixation
APLS	Advanced pediatric (paediatric) life support
AP	Anteroposterior
ASAP	As soon as possible
ATLS	Advanced trauma life support
AXR	Abdominal X-ray
b.d. (bd)	Bis die (twice daily)
b.i.w.	Twice a week
BKPOP	Below knee Plaster of Paris
BLS	Basic life support
BMJ	British medical journal
BMT	Bone marrow transplant
B/L	Bilateral
BP	Blood pressure
Ca	Carcinoma
Ca^+	Calcium
C1	First cervical vertebra
C2	Second cervical vertebra
C7	Seventh cervical vertebra
Cl	Chloride
C/I	Contraindication
cm	Centimeter (s)
CNS	Central nervous system
CO_2	Carbon dioxide
CPR	Cardiopulmonary resuscitation
CPAP	Continuous positive airways pressure
CRP	C-reactive protein
CSF	Cerebrospinal fluid
CT	Computerised (axial) tomography
CVA	Cerebrovascular accident
CXR	Chest X-ray
D	Dimension
DIP	Distal interphalangeal joint
dL	Decilitre
DLC	Differential leucocytic count
DM	Diabetes mellitus
DPL	Diagnostic peritoneal lavage
ECG	Electrocardiogram
Echo	Echocardiogram
ED	Emergency department
e.g.	For example
E.O.D.	Every other day (syn. alternate day)
esp.	Especially
ESR	Erythrocyte sedimentation rate
FB	Foreign body
FBC	Full blood count
FH	Family history
G	Gauge
g	Gram (s)
GA	General anaesthesia
GIT	Gastrointestinal tract
Hb	Hemoglobin (haemoglobin)
HCO_3	Bicarbonate
H_2CO_3	Carbonate
Hg	Mercury
HIV	Human immunodeficiency virus
hr	Hour
HRT	Hormone replacement therapy
ICP	Intracranial pressure
i.e.	That is
IgA,G,E	Immunoglobulin A, G, E
i.m. (IM)	Intramuscular
Inf	Inferior
IP	Interphalangeal

Iu	International unit
IV	Intravenous
IVI	Intravenous infusion
IVP	Intravenous pyelography
IVU	Intravenous urogram
JVP	Jugular venous pressure
K	Thousand
K^+	Potassium
KCl	Potassium chloride
kg	Kilogram
kL	Kilolitre
KUB	Kidneys, ureters, bladder
L	Litre
LA	Local anaesthesia
Lab	Laboratory
LAT	Lateral
LP	Lumbar puncture
Lt	Left
max	Maximum
MC	Metacarpal
MCP	Metacarpophalangeal
mEq/L	Millieqivalents per litre
mg	Milligrams
min	Minute/minutes
mL	Millilitre
mm Hg	Millimetres of mercury
mmol	Millimoles
mU	Million units
MTP	Metatarsophalangeal
NG	Nasogastric
NHS	National health service
NSAIDs	Nonsteroidal anti-inflammatory drugs
NVD	Nausea, vomiting, diarrhea
NWBPOP	Non-weight bearing plaster of Paris
O_2	Oxygen
OA	Osteoarthritis
o.d. (od)	Omni die (once daily)
OD	Overdose
OPD	Out-patients department
ORIF	Open reduction and internal fixation
PA	Posteroanterior
PIP	Proximal interphalangeal
PO	Per os (orally/by mouth)
POP	Plaster of Paris
P/R	Per-rectum
PTA	Post-traumatic amnesia
P/V	Per vaginum
q.d.s.(qds)	Quater in die summendus (four times daily)
q.i.d.	Quarter in die (4 times a day)
RA	Rheumatoid arthritis
RBC	Red blood cell
Rt	Right
s.c.(S/c)	Subcutaneously
SE (S/E)	Side-effect(s)
s	Second(s)
SLR	Straight leg raising
Stat	Immediately
STD	Sexually transmitted disease
Sup	Superior
SXR	Skull X-ray
TB	Tuberculosis
t.i.d./t.d.s.	Ter in die sumendus (three times daily)
THR	Total hip replacement
t.i.w.	Three times per week
TKR	Total knee replacement
T&O	Trauma and orthopedics
u/U/IU	Unit
UFH	Unfractionated heparin
ug	Microgram
URC	Upper respiratory catarrh
UTI	Urinary tract infection
USS	Ultrasound (ultrasonography) study
VDRL	Venereal diseases research laboratory
WBC	White blood cell(s)
WCC	White cell count
wk(s)	Week(s)
wt	Weight
X-match	Cross-match blood
Yr(s)	Year(s)
ZP	Zuelzer plating

Triage of Polytrauma Patient

Triage of Medical/Surgical/Orthopedic Trauma Patient

Triage is a French word meaning sorting, selection, choice. It is the process of sorting patients based upon their requirement of immediate medical/surgical treatment as compared to their chance of benefiting from such care. Trauma patients visiting A&E are to be sorted immediately by an experienced triage staff on duty, in order to attend to serious patients on priority basis. A strategy must be driven for the detection of the highest risk group, in whom early intervention can improve outcome. This decision has to be based upon UK National Triage Scale considering the seriousness of illness/or injury.

Table: Triage of polytrauma patient

National triage scale	*Treatment acuity*	*Numeric code*
Immediate resuscitation	Immediately	1
Very urgent	Within 10 mts.	2
Urgent	Within 60 mts.	3
Standard	Within 120 mts.	4
Non-urgent	Within 240 mts.	5

(*Source*: UK National Triage Scale)

The A&E and T&O staff must have a clear knowledge of the benefit and harm of each therapy, allowing formulation of a simple approach to treatment selection base0d upon the disease/injury presentation. Properly attended/treated, acute emergency should have low hospital mortality, but if neglected/untreated, mortality is high. Proper history taking & investigations usually suffice for diagnosis. Careful surveillance and management by the A&E and referred T&O team, including invasive management in selected cases substantially reduce long-term risks. The clinical question is which patients with acute symptoms have a presentation benign enough to make discharge from the A&E or T&O department safe and appropriate.

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