

## CLASSIFICATIONS OF MANDIBULAR FRACTURES-REVIEW

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### ABSTRACT

The author makes a brief review of the most familiar classifications of mandibular fractures. It shows that the base of these classifications are the categories connected with anatomical localization of the fractures.

It is pointed out the necessity of a classification which includes very well defined categories. These categories should be visualized radiologically and should be used easily by doctors with different specialties. The classification of mandibular fractures should be handy for the daily work in Emergency Departments.

**Key words:** mandibular fracture, classification

There are a lot of classifications concerning mandibular fractures. One of the most famous and utilized in clinical practice is the classification of R.Dingman and P.Natvig from 1969. /1/

According to them fractures are systematized in several categories:

A. According to the direction of the fracture /horizontal, vertical/ and whether it is favourable or not for treatment

B. According to the severity of the fracture: simple /closed/ and compound /towards the oral cavity or the skin/

C. According to the type of fracture : greenstick fracture, complex fracture, comminuted fracture, impacted fracture and depressed fracture

D. According to the presence or absence of the teeth in the jaws /dentulous, partially edentulous, edentulous/.

E. According to the location:

1. Region of symphysis
2. Canine region
3. Region of body
4. Region of angle
5. Region of ramus
6. Region of condylar process
7. Region of coronoid process

A classification of fractures according to location is simple and correlates anatomic and clinical nomenclature.

According to D. Kelly and W. Harrigan /5/ mandibular fractures were arbitrarily divided into six categories for simplification in classification. They are the same as in the above mentioned except the canine region.

We found that the base of this classification contains information not only for the anatomical localization of fractures; it reveals whether they are simple or compound; with or without dislocation; the number and dislocation of the fragments.

Classification of fractures according to the anatomical locations /similar to "E" of Dingman's classification / is the base of the classification of D.Sinn, S.Hill and S.Watson /8/. Fractures are presented in 7 categories:

1. Condylar fractures/intracapsular/
2. Subcondilar fractures
3. Coronoidal fractures
4. Fractures of mandibular ramus
5. Fractures of mandibular angle /open through third molar socket/
6. Fractures of mandibular body /open through tooth socket/
7. Fractures of symphysis.

It is essential that correct nomenclature have to be utilized in describing the different regions of the mandible that are involved by fracture.

The authors point out that mandibular fractures from a descriptive standpoint should be classified by location and by whether they are open or closed, displaced or non-displaced; complete or incomplete and linear or comminuted.

A. Pogrel and L.Kaban /7/ classified mandibular fractures in 5 groups according to the site of injury too:

1. Condylar fractures
2. Ramus fractures
3. Angle fractures
4. Body fracture
5. Fractures of symphysis and parasymphysis

Mandibular fractures are also classified as simple or comminuted and closed and compound. Fractures involving teeth are always compound as the periodontal ligament space is open in the oral cavity.

First attempt for unified and standard classification

of mandibular fractures is so called formula of fracture of A. Gratz /2/. It consists of alphanumeric symbols analog-ic to TNM classification of tumours. The author mentions the following categories:

- F-fracture
- L-localization
- S- soft tissues injuries
- A- associated maxillo-facial injuries
- O- occlusal disorders

This classification is not complete, because some very important criteria such as dislocation of fragments, tooth in a fracture line are missing.

According to WHO/1997, 2003//3/ the internation-al classification of mandibular fracures is:

- S 02.6 - Fractura mandibulae
- S 02.60 - Fractura processus alveolaris
- S 02.61 - Fractura corpus mandibulae
- S 06.62 - Fractura processus articularis/condyla-ris/
- S 06.63 - Fractura processus muscularis /coronoi-deus/
- S 02.64 - Fractura ramus mandibulae
- S 02.05 - Fractura symphysis
- S 02.66 - Fractura angulus mandibulae
- S 02.67 - Fracturae mandibulae multiplex
- S 02.68 - Unspecified mandibular fractures

The term “unspecified mandibular fractures” hav-ing in mind the contemporary apparatus is not correct.

The most popular classification of mandibular frac-tures in Russian stomatological practice is the classifica-tion of Kabakov and Malishev/4/. According to them frac-tures are systemized as following:

1. According to localization:
  - a. mandibular body/with or without teeth in frac-ture line/
  - b. mandibular ramus with its processes
2. According to the character: with or without dis-location
3. According to the number: single, double, multi-ple, unilateral, bilateral

The authors themselves found this classification incomplete and inexhaustible.

A new classification of mandibular fractures is sug-gested by A.Pankratov and T.Robustova /6/. They sug-gest a formula for mandibular fractures in 8 categories with alphanumeric marks. They underline that in com-parison with fractures of the upper and middle zones of the face, mandibular injuries are characterized by typical location and configuraration. That’s why they use letter-al and numerical symbols in formulation the diagnosis. These symbols characterize the line of fracture,involved teeth, presence /or absence/ of dislo-cated fragments, occlusive disorders, combined injuries,

status of soft tissues, presence of inflammation in the fracture line and its severity. These symbols are:

F-/fracture/: from Fo to F4 and includes: incom-plete, simple, double and multiple fractures

T- /tooth/: To, T1, T2/T2 c, T2 pu, T2 pe, T2pa - in-cludes information concerning tooth-periodontal or par-odontal changes of tooth in the fracture line

L - /localisation/: from L1 to L8- and includes the following regions: L1 - incisivum L2 - caninum L3 - praemolares – molares; L4 - angulus mandibulae L5 -ra-mus mandibulae; L6 - proc.condylaris; L7 - proc. muscu-laris /coronoideus/; L8 – proc.alveolaris

D - /dislocatio/: Do, D1, D2-with luxatio

O - /occlusion/: Oo, O1, O2 – with or without oc-cuslual changes /including classification of bone atrophy of the mandible/ O2-aI, O2-aII, O2-aIII; a I, II, III mark the bone atrophy of mandible/

S - /soft tissue/: So-closed mandibular fracture, S1- open mandibular fracture /communication with oral cavi-ty/, S2-open combined with skin injuries, S3-intra and extraoral opened fractures, S4- open fracture with soft tissue formations

I - / infectio/: Io, I1, I2 – with or without inflamma-tory changes/abscessus and flegmonas/

A - /associated/: A0, A1 – combined or not

It is obvious that this classification is too detailed, loaded and inconvinient. It contains a lot of information for clinical symptoms which can’t be presented by means of X ray study. At the other hand looking at this formula it is not clear whether the fracture is left sided or right sided, whether it is single or multiple.

#### COMMENT:

The review shows that the present classifications are not enough comprehensive. They have some lapses and some faults. For example they include a lot of cate-gories with unclear content and subjective assesment. Most of them can not be objectified by X-ray methods.

Actually the work in Emergency Departments shows a necessity of one radiological classification of mandibular fractures that should include too clear and pre-cisely defined categories which can be objectified by X-ray methods.

This radiological classification should contain clearly visualized objective information. Data of this clas-sification must faultlessly be used by all specialists from different disciplines working in Emergency Departments-traumatologists, neurosurgeons, maxillo-facial surgeons etc.

And that is necessary in order to avoid subjective evaluations.

Maxillo-facial traumatological practice requires in-formation, based on a working X-ray classification /for-

mula/to be so obvious and so precise in order to help the surgeon about the exact diagnose of mandibular fractures and their treatment.

It seems that one contemporary radiological classification of mandibular fractures should resemble TNM formula for tumours. And that would be the aim of further researches.

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