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On Construction of Ocular Traumagram

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Objective

An article on 'A model for quantification of ocular trauma' was published by the author recently [1]. However, there was problem about the construction of ocular traumagram which was on the basis of measuring the magnitude of ocular trauma. Hence a detailed methodology for construction of ocular traumagram is presented for easier comprehension. Quantification of prognosis of trauma has been reported by Kuhn et al. [2].

Methods

Traumagrams are constructed on standard graph papers (28 cm × 21 cm) with 1 sq.cm. squares. The paper is placed horizontally and the base of traumagram is represented by a horizontal base line 20 cm long, 4 cm above the lower margin of the graph paper. From the centre of the base line C a 10 cm vertical line CD is drawn. This line represents the time period in weeks up to 10 weeks. At each cm of line CD a dot is marked representing 1 week. Similarly on both sides of the centre C, a dot is marked at 1 cm distance. On the left side it represents 10% structural loss from the centre to the periphery on the left. Similarly on the right side each cm represents 10% functional loss from centre to periphery on the right. Thus at every week a dot is marked on the left side and right side indicating structural and functional loss (Figure 1). At the end of 8-10 weeks the uppermost dots on left side and right side are joined. Thus a somewhat rectangular figure is marked out which is called traumagram Figure 2 showing traumagram at 6 weeks. On the left side of the vertical line is recorded structural loss and on the left side functional loss is recorded by putting a dot. After 10 week the upper ends of the structural and functional loss are joined. This results in a somewhat rectangular area which is termed ocular traumagram. Each sq.mm enclosed in traumagram is countes. Each sq. cm is expressed as 1 Trauma Unit (T.U.). Thus an approximate measurement of ocular trauma can be done structurally, functionally and totally.

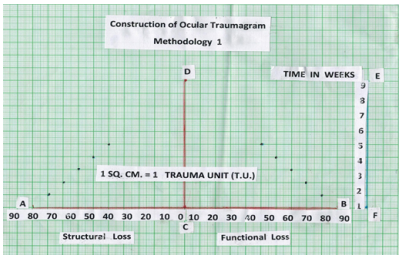

Figure 1: Construction of Ocular Traumagram Method 1.

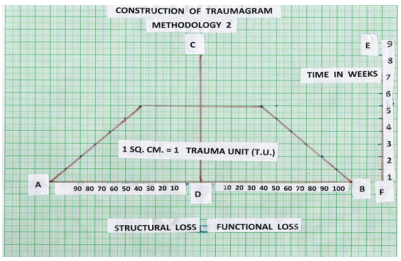

Figure 2: Construction of Ocular Traumagram Method 2.

Calculations

Calculation of structural and functional loss in % is by no means easy or accurate. Functional loss calculation is relatively easier. Vision range is between 6/6 (normal 100%) to No P.L. (0%) and can be easily recorded by vision charts. From 6/6 to 6/60 the gradation is in steps of 10%. From 6/60 downwards it is mainly in steps of 5%.

For structural loss main structures are divided in 4 groups. Gr.1 includes conjunctiva and cornea, Gr. 2 includes iris and lens, Gr. 3 includes lids and lacrimal apparatus and Gr. 4 includes Orbit and its contents (excluding eye ball). Severity of structural loss could be mild (20%), moderate (40%), severe (60%) or very severe (80%). The total loss is divided by 4. Thus each week the structural loss is calculated to get the average structural loss. Thus like functional loss structural loss is also recorded at weekly intervals in % for 8-10 weeks. At the end of the study structural and functional losses are added and divided by 2 to get the total loss in %. This can be done at weekly intervals also and can be extended for more than 10 weeks also if needed. The types of traumagram could be of various types (Figures 3- 5).

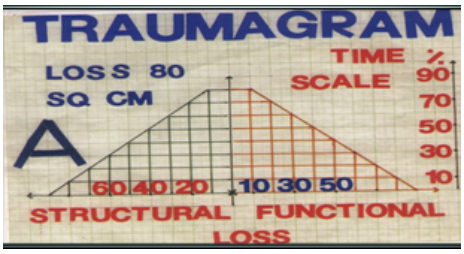

Figure 3: 'A' type Traumogram.

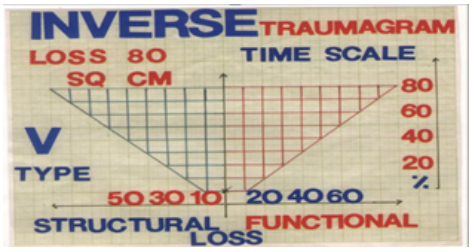

Figure 4: 'V' type Traumogram.

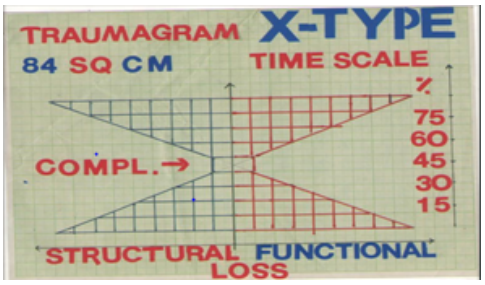

Figure 5: 'X' type Traumogram.

Conclusion

In moderate injuries the traumagram is usually closed within 8-10 weeks. The enclosed squares are counted and they directly indicate the value of ocular traumagram which indicates the severity of injury. Various patterns of ocular traumagram were obtained with specific shapes and labeled as A, V, and X types of traumagrams. here degree of damage can be known as well rate and degree of progress with treatment. It may be possible to analyze other eye diseases on these principles.

Acknowledgement

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References

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2. Kuhn F, Dante JP (2002) The OTS:Predicting the final vision of the injured eye, In Ocular Trauma:Principles and Practice. Thieme Publication pp: 9-13·