

A MORPHOLOGICAL STUDY OF CEREBRAL CONTUSIONSLiza John¹, Krishnan B²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: A cross sectional study on 70 cases is done to establish the appearance of cerebral contusions as time progresses after the causation. The documentation of appearance of contusion helps in estimating the time since causation of injury. As time progresses the colour of injury progresses from pink to Yellow.

KEYWORDS: Cerebral Contusion, Time since Death.

INTRODUCTION: Head injury especially to the brain possess great threat to life in this era of modernization. Cerebral contusions are circumscribed areas of brain tissue destruction which are accompanied by extravasation of blood into affected tissues.⁽¹⁾ A contusion is the result of subcutaneous rupture of blood vessels and the resultant escape of the blood into the tissue.⁽²⁾ There are only three types of primary brain injury which can occur at the time of head injury namely diffuse axonal injury, contusions and lacerations. Contusion of the brain results from blunt force to the head and occurs primarily following mechanical trauma and never as a delayed phenomenon. Healing of a brain contusion also follows a definite chronological order. Thus a primary study on the appearance of cerebral contusions and their association with time of occurrence provides immense data for estimation of the time of causation of injury.

MATERIALS AND METHODS: A cross-sectional study was conducted on seventy medico-legal cases brought for autopsy to the department of forensic medicine. The cases were from all age groups and comprised of both sexes. The criteria for inclusion was a known deceased person history of trauma with proper record of time of injury. Morphology of brain contusions were clearly noted for site, size and colour. Contusions having size less than 2x2cm were grouped as small and more than 5x5cm as large. Associated skull fractures, intracranial injuries and brain edema were also noted. The data obtained was analysed statistically.

OBSERVATION: 62% of the cases belonged to the age group 30-60years and 94.3% of cases were males.

Site	Frequency	Percentage
Frontal	37	53
Parietal	3	4.3
Temporal	25	35.7
Occipital	1	1.4
Frontal + Temporal	1	1.4
Frontal + Temporal + Parietal	1	1.4
Other sites (Corpus Callosum)	2	2.8

Table 1: Site of contusion

Right sided contusions were more (84.3%) when compared to left side (12.9%). In 2.9% cases both sides were affected. Of the seventy cases studied large contusions were observed in 42.9% cases followed by small (35.7%) and medium (21.4%).

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Site of fracture	No. of cases		Cerebral contusions			
	No	%	No	%	No	%
Frontal bone	3	15.8	2	16.6	1	14.3
Parietal bone	1	5.2	1	8.3		
Temporal bone	4	21	1	8.3	3	42.8
Occipital bone	2	10.5	1	8.3	1	14.3
Frontal + Parietal + temporal bone	1	5.2	1	8.3		
Parietal + temporal bone	1	5.2	1	8.3		
Anterior cranial fossa	3	15.8	3	25		
Middle cranial fossa	3	15.8	1	8.3	2	28.6
Sutural separation	1	5.2	1	8.3		

Table 2: Incidence of skull fracture and cerebral contusion

Not a single case of isolated contusion was observed. Commonest associated intracranial hamorrhage associated with contusion was subarachnoid haemorrhage followed by subdural Haemorrhage and edema.

Survival period	No. of cases	Pink	Bright red	Dark red	Reddish brown	Dark brown	Brownish Yellow	Pale Yellow
Less than 1 hour	4	1	3					
1 to 3 hours	2		2					
3 to 6 hours	4	3	1					
6 to 12 hours	5		5					
12 to 24 hours	6		1	5				
24 to 48 hours	10		8	2				
48 to 72 hours	7			6	1			
3 to 7days	12			5	6	1		
7 to 14 days	14				6	5	3	
14 to 21 days	2						2	
21 to 30 days	2					1		1
30 to 45 days	1							1
45 to 60 days	1							1

Table 3: Comparison of colour of injury and survival period

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5.7% of the contusions were pinkish in color. All cases which survived for 6 to 12 hours showed bright red color. Majority of dark red contusions were seen in Persons who survived for 48-72 hours. Contusions remain reddish brown for the first two weeks and progresses to yellowish brown by day 21 after which it progresses to pale yellow and remains so.

DISCUSSION: Isolated frontal lobe contusions (51.4%) dominated the picture followed by temporal lobe (35.7%) and is in accordance with previously conducted studies.^(3,4,5) The rough nature of anterior and idle cranial fossa accounts for the predilection of injury in frontal and temporal lobes. In 27.1% cases cerebral contusions were associated with fracture of the skull. In 25% cases the contusion was seen beneath the fracture site or corresponding to the fracture and this is in accordance with earlier studies.^(6,3) In 42.8% contusion occurred opposite to fracture of temporal bone and can be explained by sudden arrest of rotatory movement in the bony buttress of middle cranial fossa in severe blow. The commonest intracranial bleed associated with contusion is subarachnoid haemorrhage and is in full agreement with authors.^{(7),(8),(9)} that in the initial hours of formation contusions appear pinkish which is substantiated in the study.

SUMMARY AND CONCLUSION: In the present study we have identified that cerebral contusion following head injury is never an isolated event. It can occur both as coup and contre coup injury with predilection for both being the same. An attempt at ageing demonstrates that the first 6 hours shows the appearance of a pinkish contusion which progresses to yellowish brown by day 21. The gross changes should ideally be correlated with histological findings for precise estimation of age of contusion thereby estimating the time injury.

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