A Comprehensive Study on Post Traumatic Temporal Contusion in Adults

Dissertation submitted in partial fulfillment of the requirements of

M.Ch. BRANCH II NEUROSURGERY (3 YEARS)

EXAMINATIONS – AUGUST 2014

MADRAS INSTITUTE OF NEUROLOGY

MADRAS MEDICAL COLLEGE &

RAJIV GANDHI GOVERNMENT GENERAL HOSPITAL

CHENNAI – 600003

THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY

CHENNAI - 600032

CERTIFICATE

This is to certify that this dissertation entitled "**A Comprehensive Study on post traumatic Temporal Contusion in Adults**" is a bonafide work done by **Dr.R.Renganathan** in the Madras Institute of Neurology in partial fulfillment of the Tamil Nadu Dr. M.G.R. Medical University rules and regulations for award of M.Ch.(Neurosurgery) degree in August 2014, under my guidance and supervision during the academic year 2011-2014. I forward this to the Tamil Nadu Dr. M.G.R. Medical University, Chennai, Tamil Nadu, India.

Prof.K.Maheshwar, M.Ch.,
Professor & HOD of Neurosurgery
Madras Institute of Neurology
Madras Medical College &
Rajiv Gandhi Government General Hospital
Chennai 600 003

Prof.S.Syamala, M.Ch.,
Professor of Neurosurgery & guide
Madras Institute of Neurology
Madras Medical College &
Rajiv Gandhi Government General Hospital
Chennai 600 003

Dean
Madras Medical College &
Rajiv Gandhi Government General Hospital,
Chennai - 600 003

DECLARATION

I, **Dr.R.Renganathan,** solemnly declare that this dissertation "**A Comprehensive Study on post traumatic Temporal Contusion in Adults**" was done by me at the Madras Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai under the guidance and supervision of the Head of Department & Professor of Neurosurgery, Madras Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai-3, between January 2012 and December 2013.

This dissertation is submitted to the Tamil Nadu Dr. M.G.R. Medical University, Chennai-32 in partial fulfillment of the University requirements for the award of the degree of M.Ch.(Neurosurgery).

(Dr.R.RENGANATHAN)

Place : Chennai
Date : 31.03.2014

ACKNOWLEDGEMENT

I owe my thanks to the Dean **Dr.Vimala.M.D**., and previous Deans of Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, for permitting me to utilize the facilities and conducting this study and the members of Ethical Committee for their role.

I am extremely grateful to **Prof.K.Maheshwar, M.Ch.,** Professor of Neurosurgery and Head of the Department, Institute of Neurology, Madras Medical College and Rajiv Gandhi Government General Hospital, Chennai, for his constant encouragement and guidance throughout the study and periodic reviews.

I am extremely thankful to **Prof.S.Syamala, M.ch.,** Professor of Neurosurgery and my guide, for devising this study, valuable guidance, motivation, expert advice and help rendered during the procedures and throughout this study. I acknowledge **Prof.Renganathan Jothi, Prof.G.S.Jegannarayana, Prof.J.V.Mahendran, Prof.D. Balasubramanian**, for helping me with their time and advice during this study.

I also extend my thanks to my former Professors, **Prof.V.G. Ramesh, Prof.S. Sundaram, Prof.V.Sundar, Prof.K.Deiveegan,** and **Prof.S.D. Subbiah** for their advice and guidance to carry out this study.

I am indebted to all my assistant professors for their support, guidance and help to carry out this study.

The support and sacrifice of my family need special mention.

CONTENTS

Sl.No.	TITLE	Page No.
1.	INTRODUCTION	01
2.	AIM	06
3.	REVIEW OF LITERATURE	07
4.	MATERIALS AND METHODS	13
5.	OBSERVATIONS AND RESULTS	16
6.	ANALYSIS AND DISCUSSION	53
7.	CONCLUSION	55
8.	BIBILIOGRAPHY	
9.	APPENDICES	

A Comprehensive Study on Post Traumatic Temporal Contusion in Adults

Abstract

Aim

To observe and study the epidemiology, clinical features, radiological findings, management and outcome of Traumatic Temporal contusion in brain injury.

Materials and methods

This study is a prospective observational study. . This study was conducted on the patients admitted in the head injury ward and diagnosed as having temporal lobe contusion from January 2012 to December 2013 at the institute of Neurology, Rajiv Gandhi Government General Hospital, Chennai

Inclusion Criteria:

- Adults with unilateral temporal contusion following trauma

Exclusion Criteria:

1. Patients treated and referred from other hospitals
2. Patients with history of any previous intra cranial procedures
3. Patients with other associated parenchymal injuries
4. Patients with bleeding diathesis

5. Patients taking anticoagulant drugs
6. Patients with any comorbid medical illness (DM, Hypertension, Renal Failure, chronic alcoholism…)
7. Patients with other system injuries
8. Patients under the influence of alcohol

About 131 patients were enrolled for the study. 25 patients were excluded from this study based on the exclusion criteria mentioned above. The remaining 106 patients were enrolled for this study.

A detailed history about the patients diagnosed to have temporal contusion following head injury and admitted at RGGGH, Chennai were taken. The variable factors like age, sex, mode of injury, time interval between injury and admission, LOC, Seizures, vomiting, ENT bleed were noted. Then a detailed clinical examination was done and the status of the pupils reaction to light, size, extra ocular movements/Doll s eye movement and GCS were noted. Speech assessment was not included in this observational study. All the patients underwent routine investigations that include, complete blood count, blood sugar, urea, creatinine, electrolytes, bleeding time, clotting time, blood grouping typing, urine albumin, sugar, deposits, X-Ray chest PA view and CT Scan brain plain with bone window. The side of the lesion, its volume, basal cistern status , midline shift are assessed. Patients with temporal contusion greater than

20 ml, with midline shift more than 5mm, with basal cistern effaced, with GCS less than 8 and progressive neurological deterioration referable to the lesion as per the brain trauma foundation surgical guidelines were operated and others are managed conservatively.[12]

A master chart (appendix) is prepared based on the collected data. A statistical analysis of the master chart is done using chi square test.

Results

The overall mortality is 18.9% in traumatic temporal contusion This study shows that 62.2% of the patients survived and 30.8% of the patients expired with surgical management. Seizure, abnormal pupillary response to light, occulocephalic reflex abnormality and the status of the basal cistern, midline shift and volume of the lesion are the significant factors , in this study.

Conclussion

Temporal contusion occur usually in MVA. Patients with history of seizure after trauma, abnormal pupillary response, defective occulocephalic reflex, bradycardia, low GCS and patients with GCS deterioration after admission need detailed evaluation and the radiological features of effaced basal cistern, midline shift and volume must be assessed to decide about early surgical intervention and to reduce the mortality.

INTRODUCTION

Motor vehicle accidents (MVA) are the major cause of head injuries and most commonly head injuries occur in adult population. Primary head injuries are classified as diffuse brain injuries, focal brain injuries and skull fractures. Contact injuries and head motion injuries are the basic mechanistic types of head injuries. The mechanical loading may be static or dynamic. The dynamic loading may be impulsive or impact type.

The brain undergoes various types of strain during injury. The strain may be in the form of compression, tensile strain or shear strain. More than one type of mechanics and more than one type of strain are involved in most head injuries.[1]

Injuries occur when the tissue is not able to withstand the strain. The capacity to resist the strain varies from tissues to tissues. Depending upon that, different tissues have varying degree of injury[1]

In head injuries following trauma, cerebral contusion is the most frequently encountered lesion. The classic and primary hall mark of brain trauma is contusion.[1]

Contusions are defined as bruise of the brain surface with intact arachnoid and pia. If it is torn, it is called as laceration. When the intra

parenchymal contusion is in continuity with an acute sub dural hemorrhage, it is called as burst lobe.

The contusions are classified as fracture contusion, herniation contusion, gliding contusion, coup, intermediate coup and contre coup contusion. Fracture contusions are contusion that arise from direct injuries and lies adjacent to the fracture site. Coup contusions are those that lie near the site of impact without any fracture. Contre coup contusions are contusion that are not exactly below the impact site. Due to complex anatomy of the skull it may not be exactly opposite the site of impact [(1), (2)]

Gliding contusions are focal lesion that involves the cortex and adjacent white matter due to rotational movements rather than contact forces. Intermediate contusions are lesions that lie in corpus callosum, basal ganglia and brain stem. Herniation contusions are those that lie in the part of the brain that herniates, eg: uncal herniations that cause contusion in medial temporal lobe that contacts tentorium.

Most contusion in closed head injuries in MVA are due to the acceleration deceleration injuries. The blunt contact of the brain with the bony skull surface causes contusion. In closed head injuries, the polar regions of the frontal and temporal lobe and the under surface are the most common site of contusion.

Among the cerebral contusion temporal contusion is found in most fatal head injuries. The location of the temporal lobe near the tentorial hiatus leads to rapid herniation in severe temporal lobe contusion.

In head injuries with temporal lobe contusion, the necrotic pulped brain tissue swells and produce increase in ICP which leads to fatal outcome. The swollen contused brain produce pressure effect on the blood vessels, which on compressing the middle cranial fossa blood vessels, produce secondary ischemia which may be extensive.[2]

The majority of patients with temporal contusion have associated base of frontal lobe injuries and brain stem injuries. In certain cases the temporal lobe injury is the major component and it produces a characteristic clinical picture.

The gross appearance of contusion is an area of hemorrhage beneath pia, extending through cortex into white matter. They are wedge shaped with the base over the gyri. There is breakdown of the traumatized neural parenchyma and RBCs with phagocytosis of the debris. This results in shrinkage, so that old contusion is depressed, with hemosiderin discoloration of the attached leptomeninges. RBC lysis is evident by within 48-72hrs, Macrophages increases from 24hrs to several weeks and reactive gliosis is seen as early as 48hrs around a contusion.

In brain injury, ischemia and hypoxia are secondary events. There will be increase in extracellular K^+ which cause release of depolarization induced neurotransmitters release, which in turn cause vasoconstriction. The O^2 supply for the tissues decrease which leads to decrease in ATP production. This leads to defective Na^+, K^+, Ca^+ and $HCO3^-$ ion transport mechanism which is the cause for the systemic manifestation like water and electrolyte abnormalities, hormonal abnormalities and cardiopulmonary malfunction.

The patients with temporal contusion presents with various clinical features like pupillary abnormality, seizure, vomiting, ENT bleed, loss of consciousness and neurological deficit. The changes in the level of consciousness, pupils initially reacting to light become fixed and dilated, changes in the respiratory pattern and posturing indicate impending tentorial herniation. The systemic signs of impending herniation also include increased blood pressure, wide pulse pressure and bradycardia.

CT scan brain plain has become the first line of imaging in the early diagnosis of contusion. The product of the extent and depth of contusion damage is the contusion index, which aids in the objective evaluation and clinical correlation. The radiological features aids in the management of the patient.

Decompressive craniotomy and evacuation of the contusion is the major surgical procedure performed for the patients fulfilling the surgical criteria in out setup.

AIM

- To observe and study the epidemiology, clinical features, radiological findings, management and outcome of Traumatic Temporal contusion in brain injury.

REVIEW OF LITERATURE

In India, among MVA, 23.2% is by two wheeler, 19.2% is by truck, 10.1% is by car, 9.4% is by bus, 8.3% in pedestrians, 6.7% by jeep, 5.7% by van, 4.8% by 3 wheeler, 2.2% in bicycle related injuries and others 10.3%.

India has 1 % of the vehicles of the world but the MVA is about 6% of the world MVA. The rate of MVA in India is 35 per 100 vehicles which is one of the highest in the world and 25.3 per 1000 vehicles as per Transport Research Wing, Ministry of Road Transport and Highways, Road Accidents in India 2011.

National Crimes Records Bureau, Accidental Deaths and Suicides in India 2012 statistics on MVA reveals that MVA occur more in rural areas (53.5%) than NH (30.1%) and SH (37.1%). Injured persons are more in rural 59.4% than urban 40.6%. Fatalities are more in rural (63.4%) than urban areas (36.6%).

The victims are more in the age group between 25 and 65 (51.9%) and 15% are females during the year 2012 as stated in National Crimes Records Bureau, Accidental Deaths and Suicides in India 2012.

Most accidents occur between 1500 hours and 1800 hours 16.7%, then between 1800 and 2100 16.6% and 6.3% between 0000 and 0300 hours, 2012.

The single most common factor for the accident is the fault of the driver as revealed by an analysis of road accident data by the Ministry of Road Transport and Highways.

Courville [(2)] in his article on coup contrecoup mechanism stated that about 70% of severe head injured patients have temporal contusion.

Tandon PN, 1978[(3)] in his study on consecutive 1000 cases of severe head injuries at AIIMS, shows ,85 cases have temporal lobe contusion and most of them are contrecoup injury. Majority of the patients have hemiparesis and pupillary abnormality and majority of the patients undergoing surgery for head injuries have temporal contusion. Smaller lesion with no neurological deterioration can be managed conservatively.

Gennarali 1982,[(4)] in his study on the influence of the type of intracranial lesion in the outcome in severe head injured patients and on the treatment protocol for traumatic temporal contusion comparing the conservative and surgical management concluded that GCS on the next day of trauma is an important predictor of the outcome.

Lobato[5] studied the CT scan brain of the patients with head injuries and concluded that CT scan findings were important in predicting the outcome

Andrews[6] implied that when the volume of the temporal contusion is more than 30ml, the chance of tentorial herniation and brain stem compression are more likely.

Ross Bullock,[7] [12]) concluded that the radiological feature suggesting of basal cistern effacement is a surgical indication irrespective of the GCS status. He also mentioned that the status of the basal cistern in CT scan brain, the size of the contusion, cerebral oedema and GCS correlate well with the outcome in patients with head injury.

Yamaki[9] stated that most of the contusion in patients with head injury reaches their maximum size within 24 hours of injury.

Kofwica & jokubowsi [10] quoted that the initial GCS of the patients at the time of admission is an important predictor of the outcome in patients with head injury. They added in their statement that less attempt should be made in patients with age above 70 years and GCS less than 9.

Tseng,[11] noticed better outcome in patients who have temporal lobectomy in addition to the surgical procedure.

Bullock,[12] in his chapter on the surgical management in traumatic parenchymal lesion recommended that patients with GCS 6 to 8 with temporal contusion more than 20 cc in volume and/or compression of the cistern with midline shift of minimum 5mm should be treated surgically.

Choksey [13] stated that, in head injured patients, when the volume of the contusion in the initial CT scan brain was above 16 ml, the probability of deterioration increased.

Munch (2000) quoted that craniectomy up to middle cranial fossa base reduced the midline shift and the mesencephalic cistern visibility improved the outcome.[14]

The outcome in patients with GCS <6 and volume >50ml, is better when they undergo early surgery, Mathiesen.(2000) et al.[15]

Patel (2000) stated that most of the deterioration in patients who were subjected to conservative management and later taken up for surgery occurred within 24 hours.[16]

Carole L[17] White in his original article on early progression of traumatic cerebral contusion; characterization and risk factors, studied 46 patients with head injury. The result in his study was that 65% of the patients have early progression of the lesion with in twenty four hours. He

also found that in patients with deterioration in GCS were associated with 3 fold risk of expansion of the lesion.

Alexandre V Giannetti, 2005[18], the surgical management in post-traumatic temporal contusion is controversial. In his retrospective study on the tomographic findings on 69 patients, he concludes that in surgically treated temporal contusion, more anterior the lesion, smaller the diameter.

Asha Ari ZA, 2011[19] studied the prevalence and pattern of contrecoup injuries in patients with traumatic temporal bone fracture in about1579 cases of head injury to conclude that the commonest contrecoup injury is contusion followed by extradural hematoma and subdural hematoma. They are significantly associated with petrous temporal bone fracture.

Gupta prashant K, JPMS 2011[20] in his cross sectional study on CT scan findings and outcome of head injury patients, 382 patients, concluded that CT scan detected and localized precisely the parenchymal brain injuries and the outcome is predicted effectively.

Motah Mathieu et al, 2014[21] in his study on the surgical management of severe head injury with cerebral herniation, concludes that the outcome in patients with blunt head trauma with severe brain injury could improve with decompressive craniectomy.

On reviewing the literature, the behavior of temporal contusion depends on many factors such as size, .midline shift basal cistern status, associated injuries and CT scan contribute for deciding the management.

The patients with temporal contusion greater than 20ml, with midline shift of at least 5mm/and or compression of the cistern in CT scan brain should be treated operatively[12]

Different methods like computer based method, ellipsoid method and cavalieri method are used to measure the lesion volume[22]. When the digital volumetric determination of the volume using CT computer is not possible, ellipsoid method which can easily calculate the volume can be used as an alternative. The basic concept in ellipsoid method is that the ellipsoid volume is half of the volume of the parallelepiped into which it is placed. The greatest diameter is measured (A), another greatest diameter (B) 90^0 to (A) is measured on a CT scan slice, the vertical distance is calculated from the number of slice, a parallelepiped is reconstructed and half of its volume is approximately the volume of the contusion[23].

MATERIALS AND METHOD

This study is a prospective observational study. In this study the epidemiological features, clinical findings and radiological findings that are routinely used to assess and to decide about the management of patients with posttraumatic temporal contusion patients are analyzed. This study was conducted on the patients admitted in the head injury ward and diagnosed as having temporal lobe contusion from January 2012 to December 2013 at the institute of Neurology, Rajiv Gandhi Government General Hospital, Chennai.

Inclusion Criteria

- Adults with unilateral temporal contusion following trauma

Exclusion Criteria

1. Patients treated and referred from other hospitals
2. Patients with history of any previous intra cranial procedures
3. Patients with other associated parenchymal injuries
4. Patients with bleeding diathesis
5. Patients taking anticoagulant drugs
6. Patients with any comorbid medical illness (Diabetes Mellitus, Hypertension, Renal Failure, chronic alcoholism…)

7. Patients with other system injuries

8. Patients under the influence of alcohol

About 131 patients were enrolled for the study. 25 patients were excluded from this study based on the exclusion criteria mentioned above. The remaining 106 patients were enrolled for this study.

Methodology

A proforma with all the information necessary for the study was formulated. All the parameters necessary are filled up in the proforma for all the patients enrolled in this study.

A detailed history about the patients diagnosed to have temporal contusion following head injury and admitted at Rajiv Gandhi Government General Hospital, Chennai were taken. The variable factors like age, sex, mode of injury, time interval between injury and admission, LOC, Seizures, vomiting, ENT bleed were noted. Then a detailed clinical examination was done and the status of the pupils reaction to light, size, extra ocular movements/Doll s eye movement and GCS were noted. Speech assessment was not included in this observational study. All the patients underwent routine investigations that include, complete blood count, blood sugar, urea, creatinine, electrolytes, bleeding time, clotting time, blood grouping typing,

urine albumin, sugar, deposits, X-Ray chest PA view and CT Scan brain plain with bone window.

The CT scan brain images were analyzed to know the side, size, site of contusion, midline shift, status of the basal cistern. The volume is calculated by the ellipsoid method, 1/2 x abc. a - greatest diameter in the CT scan slice, b- diameter measured 90 degree to a, c- vertical height measured by the number of slice.

Patients with temporal contusion greater than 20 ml, with midline shift more than 5mm, with basal cistern effaced, with GCS less than 8 and progressive neurological deterioration referable to the lesion as per the brain trauma foundation surgical guidelines were operated and others are managed conservatively.[12]

A master chart (appendix) is prepared based on the collected data. A statistical analysis of the master chart is done using chi square test.

OBSERVATIONS AND RESULTS

A total of 106 patients with traumatic temporal contusion are included in this study and the information collected are analyzed as follow. All the parameters are analyzed for the outcome.

1. (a)Age distribution

Age wise distribution	
AGE in years	**No. of patients**
13 – 20	**6**
21 – 30	**25**
31 – 40	**22**
41 – 50	**22**
51 – 60	**21**
61 – 70	**7**
Above 70	**3**
Total	**106**

Table 1: Among the 106 patients, most of them were in the age group of 21-30, followed by 31-40 then 41-50 and 51-60.age. 90 patients were between 21-60 years of age.

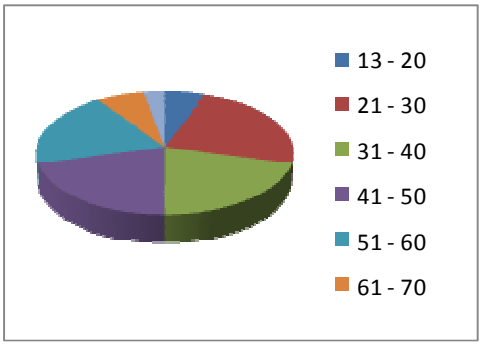


Fig 1 Age distribution

1. (b)Age in years * Outcome

Age in years		Outcome		Total	
		Alive	Dead		
Below 20	Count	6	0	6	
	% within Age in years	100.0%	.0%	100.0%	
	% within Outcome	7.0%	.0%	5.7%	
21-30	Count	18	7	25	
	% within Age in years	72.0%	28.0%	100.0%	
	% within Outcome	20.9%	35.0%	23.6%	
31-40	Count	20	2	22	
	% within Age in years	90.9%	9.1%	100.0%	
	% within Outcome	23.3%	10.0%	20.8%	
41-50	Count	17	5	22	
	% within Age in years	77.3%	22.7%	100.0%	P value .485
	% within Outcome	19.8%	25.0%	20.8%	
51-60	Count	17	4	21	
	% within Age in years	81.0%	19.0%	100.0%	
	% within Outcome	19.8%	20.0%	19.8%	
61-70	Count	5	2	7	
	% within Age in years	71.4%	28.6%	100.0%	
	% within Outcome	5.8%	10.0%	6.6%	
Above 70	Count	3	0	3	
	% within Age in years	100.0%	.0%	100.0%	
	% within Outcome	3.5%	.0%	2.8%	
Total	Count	86	20	106	
	% within Age in years	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 2 : Applying the statistical test for the outcome of the patient for the age, 86 patients are alive and 20 patients expired. (p. value .485).

1. (a) Sex Distribution

Sex Distribution	
Sex	**No. of patients**
MALE	**101**
FEMALE	**5**
Total	**106**

Table 3: Among the 106 patients, there are101 males and 5 females. Males met with maximum head injuries.

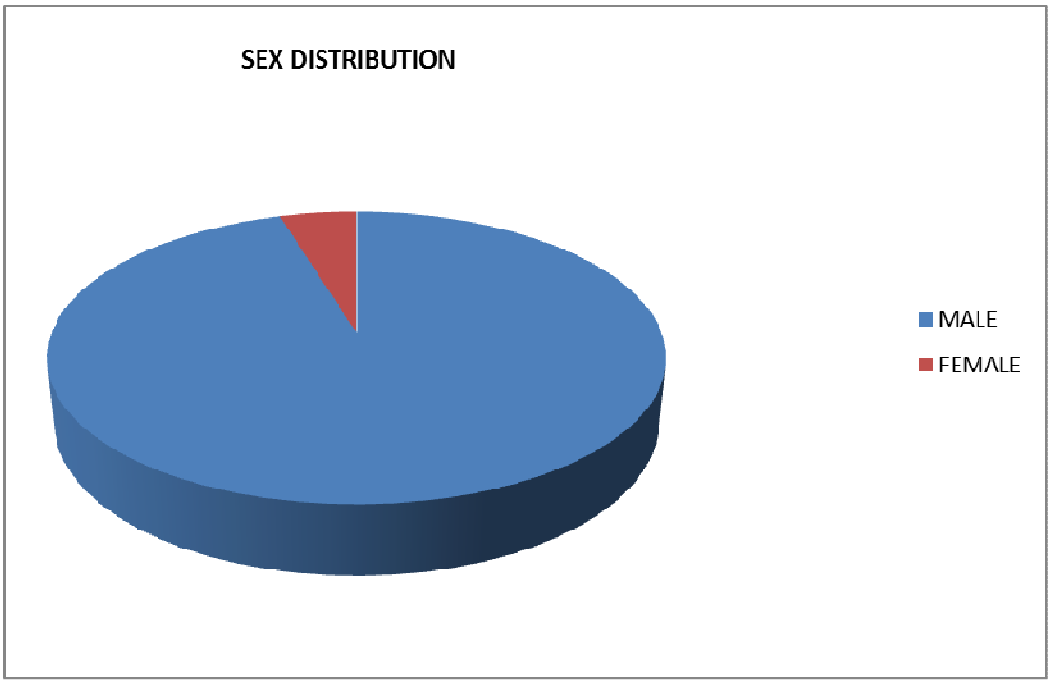


Fig: 2Sex Distribution

2 . (b)Sex * Outcome

Sex		Outcome		Total	P value
		Alive	Dead		
Male	Count	82	19	101	
	% within Sex	81.2%	18.8%	100.0%	
	% within Outcome	95.3%	95.0%	95.3%	
Female	Count	4	1	5	
	% within Sex	80.0%	20.0%	100.0%	
	% within Outcome	4.7%	5.0%	4.7%	
Total	Count	86	20	106	0.947
	% within Sex	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 4: On statistical analysis, sex is not significant factor in predicting the outcome p(0.947).

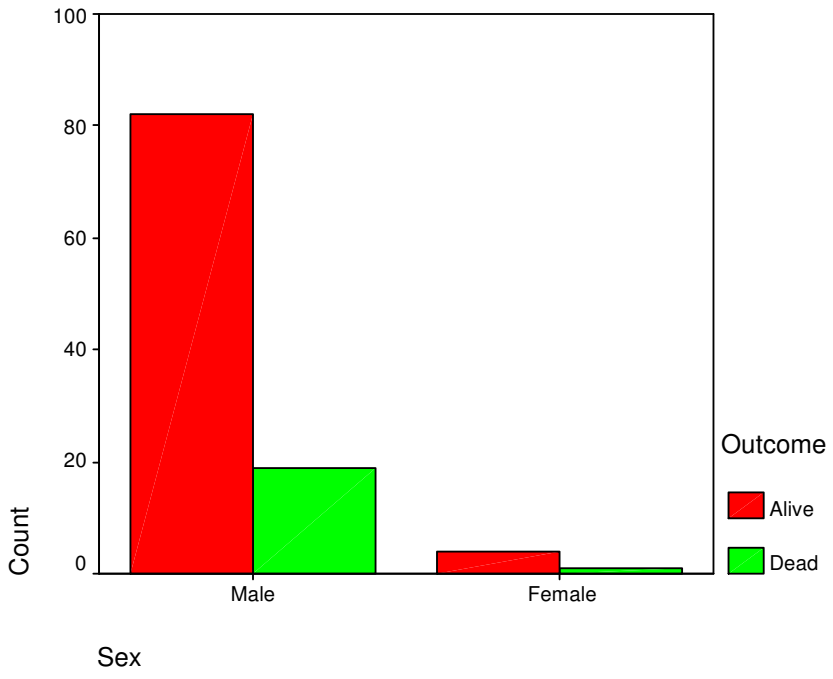


Fig: 3 sex -outcome

3 (a). Mode of Injury

Mode if injury	
Mode	**No. of patients**
RTA	**90**
FALL	**11**
ASSAULT	**5**
Total	**106**

Table 5: emporal contusion caused by MVA predominantly occurs in 90 patients followed by fall (11) and assault (5).

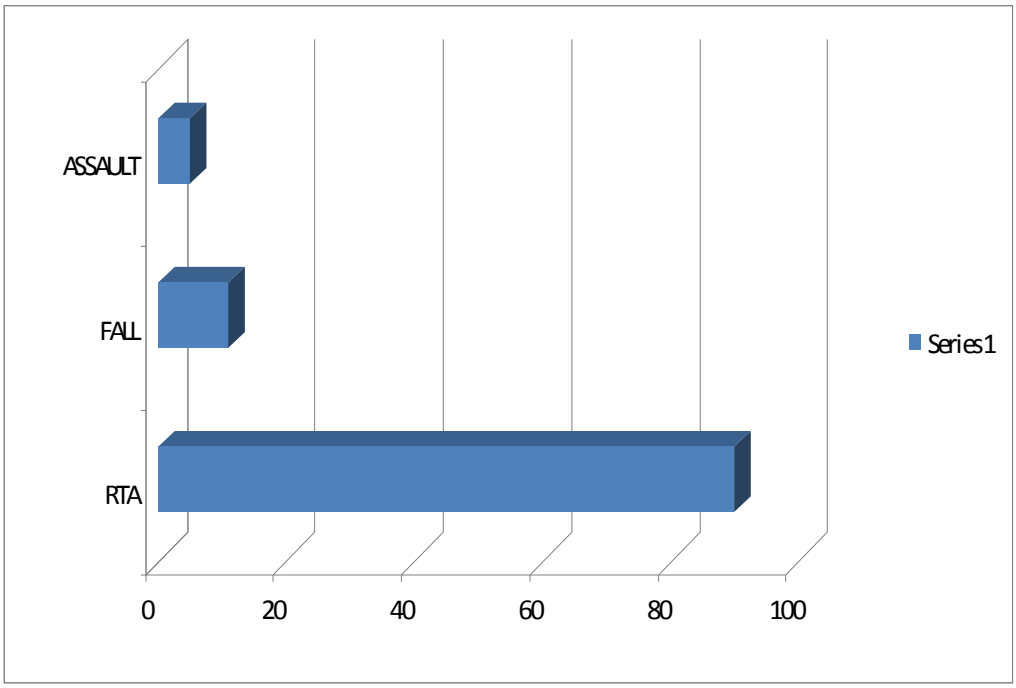


Fig:4. Mode of Injury

3. (b)Mode of Accident * Outcome

Mode of Accident		Outcome		Total	
		Alive	Dead		
Road Traffic Accident	Count	70	20	90	
	% within Mode of Accident	77.8%	22.2%	100.0%	
	% within Outcome	81.4%	100.0%	84.9%	
Fall	Count	11	0	11	
	% within Mode of Accident	100.0%	.0%	100.0%	
	% within Outcome	12.8%	.0%	10.4%	P.value .112
Assault	Count	5	0	5	
	% within Mode of Accident	100.0%	.0%	100.0%	
	% within Outcome	5.8%	.0%	4.7%	
Total	Count	86	20	106	
	% within Mode of Accident	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 6 : The statistical analysis of the outcome to the mode of injury shows that there is 22.2% mortality in MVA.(p .112)

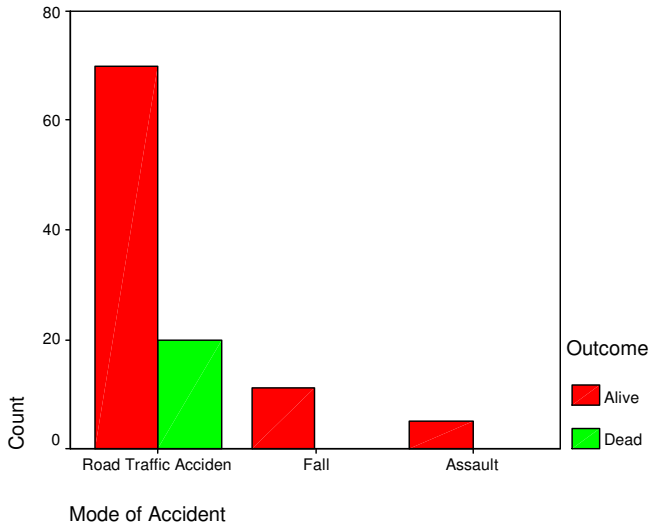


Fig: 5 Mode of Accident - Outcome

4. Clinical Features

Clinical Features	
Clinical features	**No .of patients 106**
Seizure	**32**
Vomiting	**73**
ENT bleed	**24**
LOC	**83**

Table 7 : In this study, there is history of LOC in 83 patients, vomiting in 73, and ENT bleed in 24 and seizure in 32 patients. All the above clinical history is analyzed by chi square test individually for the outcome.

4(a).Seizure * Outcome

Seizure		Outcome		Total	
		Alive	Dead		
Absent	Count	70	4	74	
	% within Seizure	94.6%	5.4%	100.0%	
	% within Outcome	81.4%	20.0%	69.8%	
Present	Count	16	16	32	
	% within Seizure	50.0%	50.0%	100.0%	p.value <0.001**
	% within Outcome	18.6%	80.0%	30.2%	
Total	Count	86	20	106	
	% within Seizure	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table:8

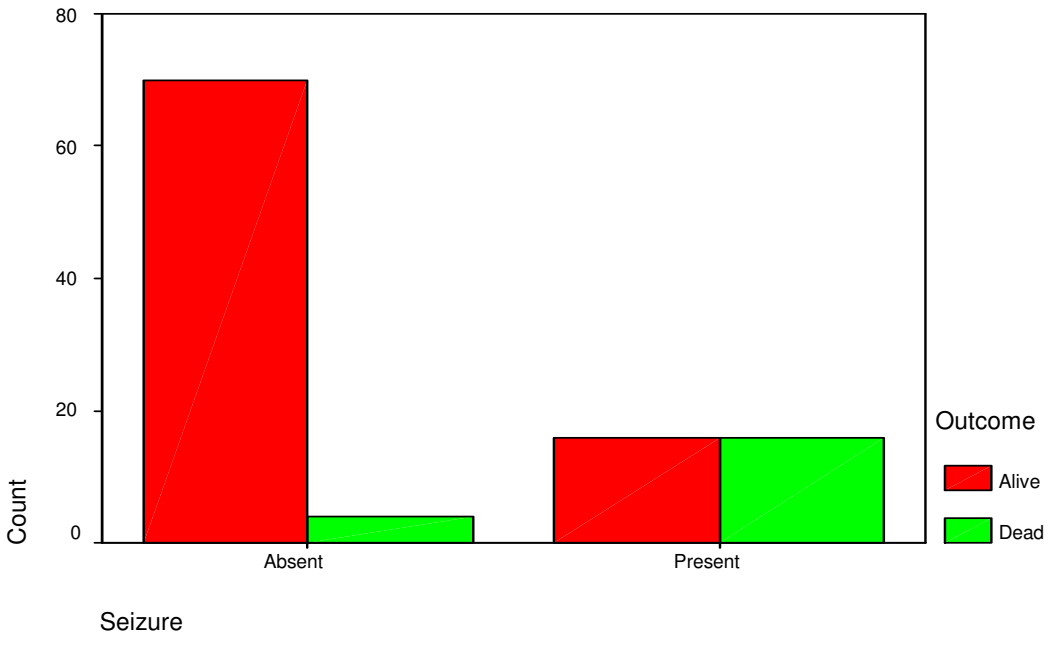


Fig:6 .Seizure – Outcome

4. (b)Vomiting * Outcome

Vomiting		Outcome		Total	
		Alive	Dead		
Absent	Count	30	3	33	
	% within Vomiting	90.9%	9.1%	100.0%	
	% within Outcome	34.9%	15.0%	31.1%	p.value
Present	Count	56	17	73	.084
	% within Vomiting	76.7%	23.3%	100.0%	
	% within Outcome	65.1%	85.0%	68.9%	
Total	Count	86	20	106	
	% within Vomiting	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table: 9

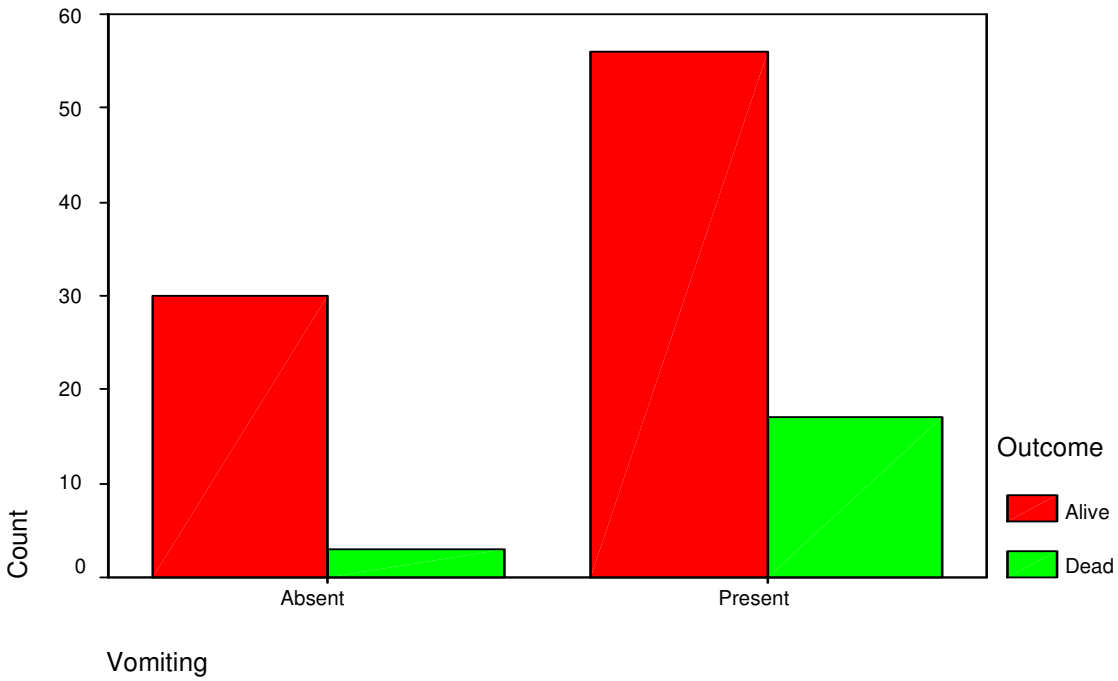


Fig 7.Vomiting - Outcome

4(c).Ent Bleed * Outcome

ENT Bleed		Outcome		Total	
		Alive	Dead		
Absent	Count	69	13	82	
	% within Ent Bleed	84.1%	15.9%	100.0%	
	% within Outcome	80.2%	65.0%	77.4%	
Present	Count	17	7	24	p.value .143
	% within Ent Bleed	70.8%	29.2%	100.0%	
	% within Outcome	19.8%	35.0%	22.6%	
Total	Count	86	20	106	
	% within Ent Bleed	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table: 10

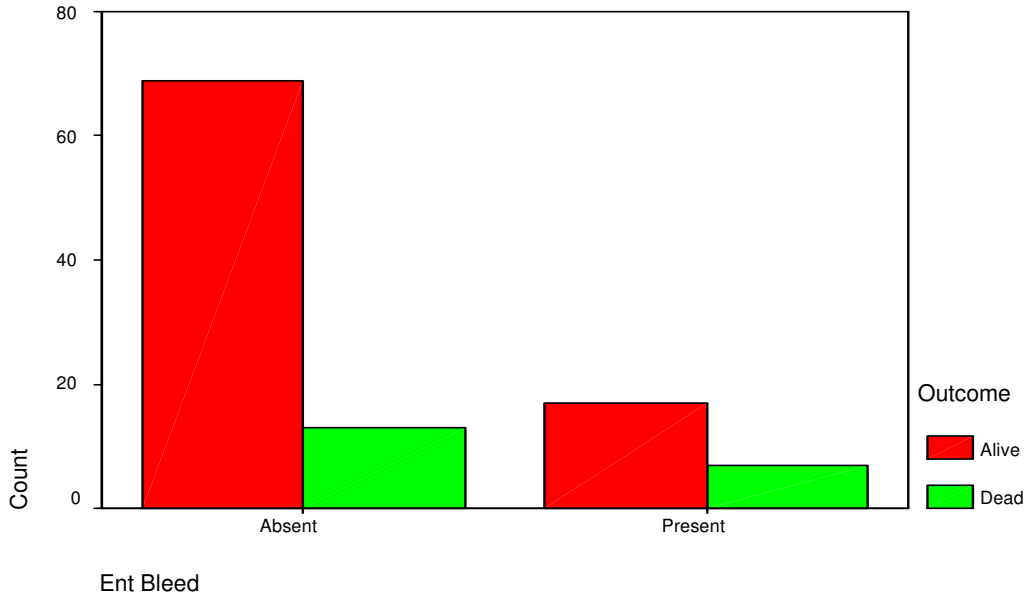


Fig 8.ENT Bleed - Outcome

4(d).Loss of Consciousness * Outcome

Loss of Consciousness		Outcome		Total	
		Alive	Dead		
Absent	Count	20	3	23	
	% within Loss of Consciousness	87.0%	13.0%	100.0%	
	% within Outcome	23.3%	15.0%	21.7%	
Present	Count	66	17	83	
	% within Loss of Consciousness	79.5%	20.5%	100.0%	p.value .420
	% within Outcome	76.7%	85.0%	78.3%	
Total	Count	86	20	106	
	% within Loss of Consciousness	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table: 11

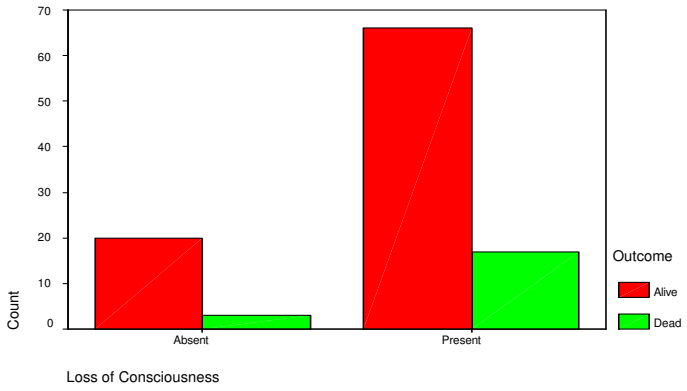


Fig 9.Loss of Consciousness * Outcome

On analyzing the above data by chi square test, seizure is more significant (p<0.001**), followed by vomiting (p value 0.84), ENT bleeding (p.value .143) and LOC (p.value .420). This is shown in the bar diagram below.

5. (a)GCS on admission

GCS on admission	
GCS	**No. of patients**
3 - 8	**7**
9 - 12	**51**
13 - 15	**48**
Total	**106**

Table 12: Majority of the patients in our study were admitted with GCS 9-12 followed by patients with GCS 13- 15. 7 patients presented with GCS 3-8.

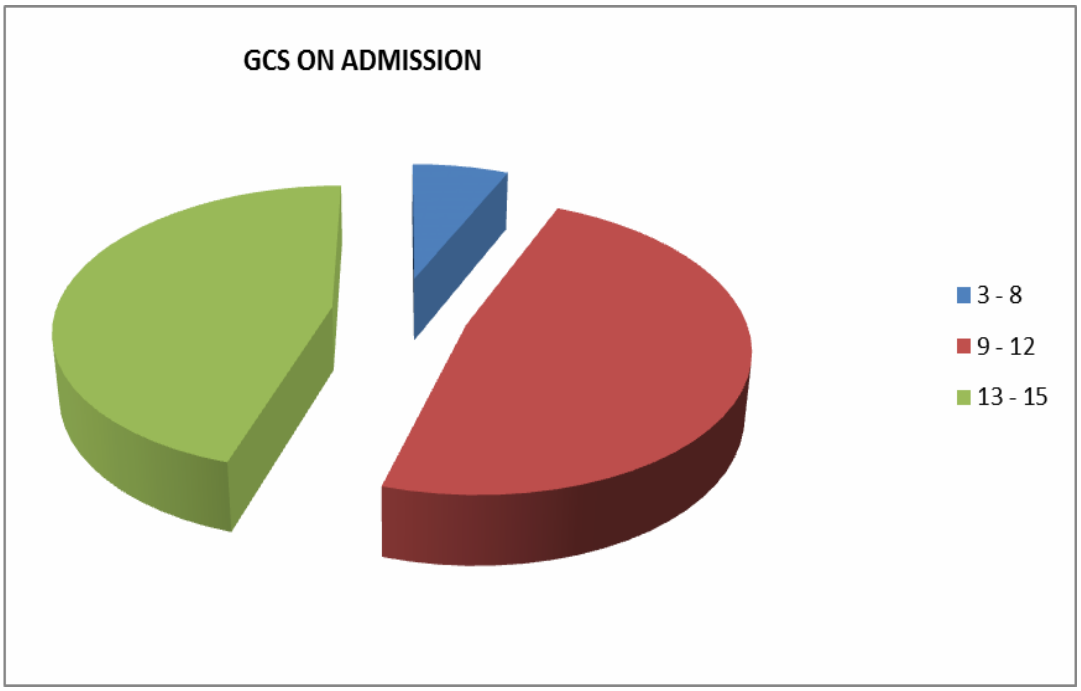


Fig:10 GCS on admission

5(b).GCS on Admission * Outcome

GCS at admission		Outcome		Total	
		Alive	Dead		
13-15	Count	48	0	48	p.value <0.001**
	% within GCS at Admission	100.0%	.0%	100.0%	
	% within Outcome	55.8%	.0%	45.3%	
9-12	Count	36	15	51	
	% within GCS At Admission	70.6%	29.4%	100.0%	
	% within Outcome	41.9%	75.0%	48.1%	
3-8	Count	2	5	7	
	% within GCS At Admission	28.6%	71.4%	100.0%	
	% within Outcome	2.3%	25.0%	6.6%	
Total	Count	86	20	106	
	% within GCS At Admission	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 13 : On analysis, the GCS on admission is significant in this study**.** (p.<0.001**)

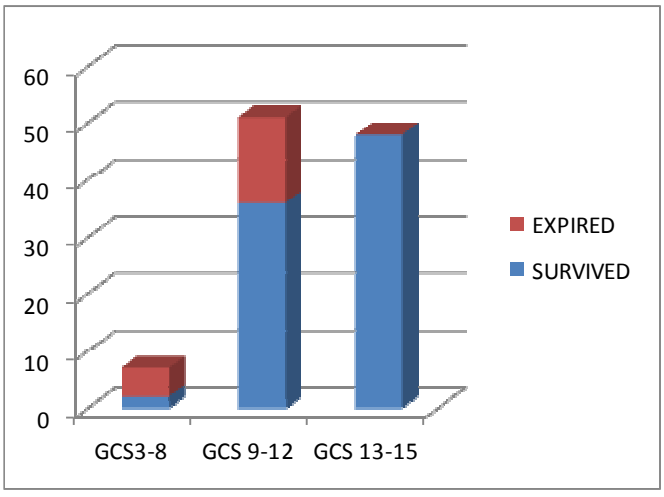


Fig: 11 GCS on Admission * Outcome

6.(a) GCS on Deterioration

GCS on Deterioration	
GCS	**No .of patients**
Deterioration	**39**
No Deterioration	**67**
Total	**106**

Table 14 : GCS score for 39 patients deteriorated on the day of admission and 67 patients remain stable

6(b).GCS On Deterioration * Outcome

GCS on Deterioration		Outcome		Total	
		Alive	Dead		
No	Count	59	8	67	p.value .017
	% within GCS On Deterioration	88.1%	11.9%	100.0%	
	% within Outcome	68.6%	40.0%	63.2%	
Yes	Count	27	12	39	
	% within GCS On Deterioration	69.2%	30.8%	100.0%	
	% within Outcome	31.4%	60.0%	36.8%	
Total	Count	86	20	106	
	% within GCS On Deterioration	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 15: 39 patients deteriorated after admission. On analyzing the data. The deteriorating GCS after admission is significant (p.value .017). But the admission GCS has more significant in this study **(p. <0.001**)**

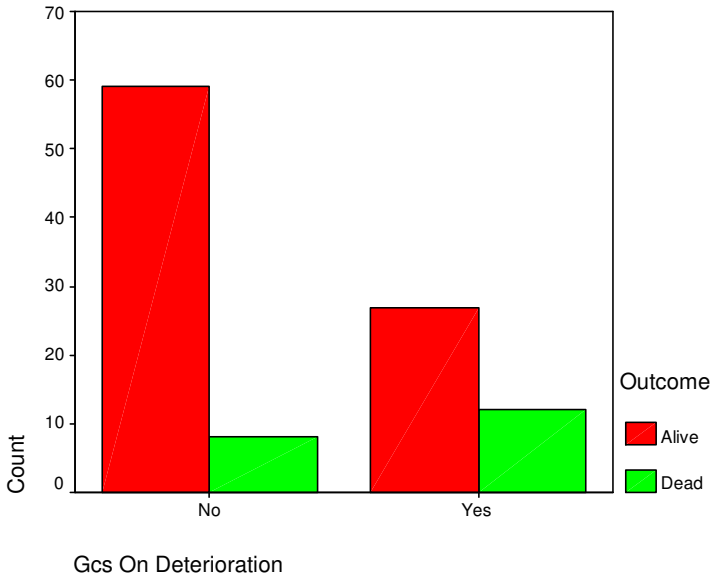
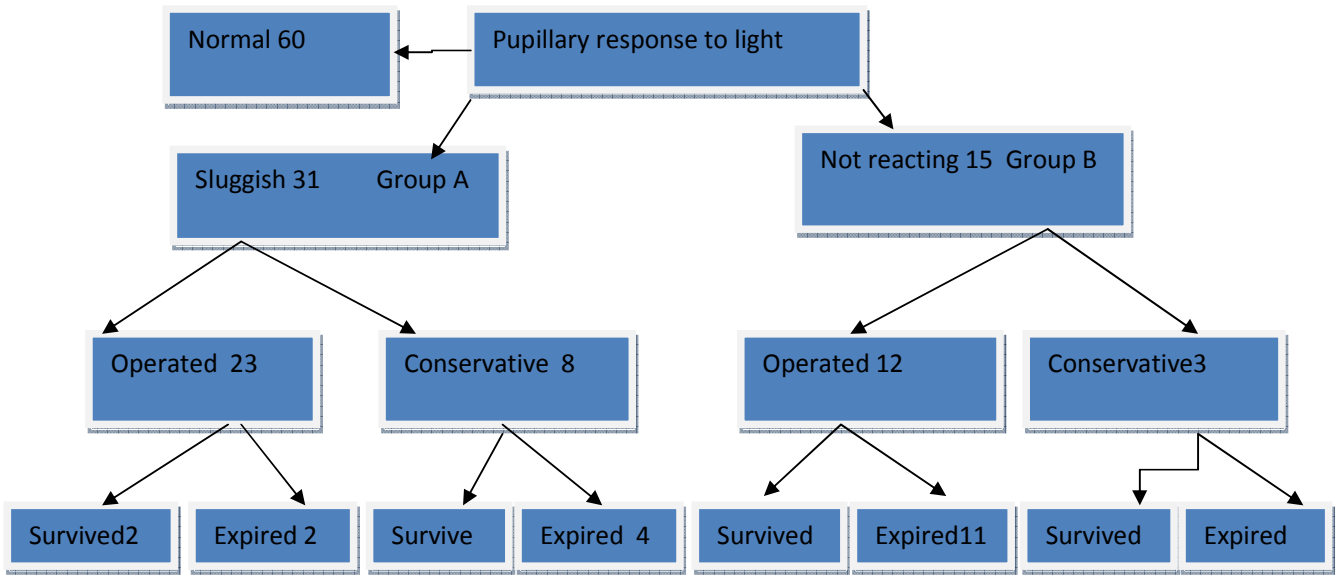


Fig 12.GCS on Deterioration - Outcome

7(a). Pupillary Reaction to Light



Flow chart : 1 Pupillary response to light

The pupillary response was normal in 60 pts,31 show sluggish reaction (A) and 15 pts have no pupillary response (B) to light. Among the operated group21 survived and 2 expired. 111 patients operated under group B survived and 1 expired.

7(b).Pupillary Reaction * Outcome

Pupillary Reaction		Outcome		Total	
		Alive	Dead		
Normal	Count	60	0	60	p.value <0.001**
	% within Pupillary Reaction	100.0%	0%	100.0%	
	% within Outcome	69.8%	0%	56.6%	
Sluggish	Count	25	6	31	
	% within Pupillary Reaction	80.6%	19.4%	100.0%	
	% within Outcome	29.1%	30.0%	29.2%	
Not Reacting	Count	1	14	15	
	% within Pupillary Reaction	6.7%	93.3%	100.0%	
	% within Outcome	1.2%	70.0%	14.2%	
Total	Count	86	20	106	
	% within Pupillary Reaction	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 16: On analyzing the outcome of the patients with pupillary response to light, this Study shows that the response of the pupil to light is significant with (p.value<0.001**)

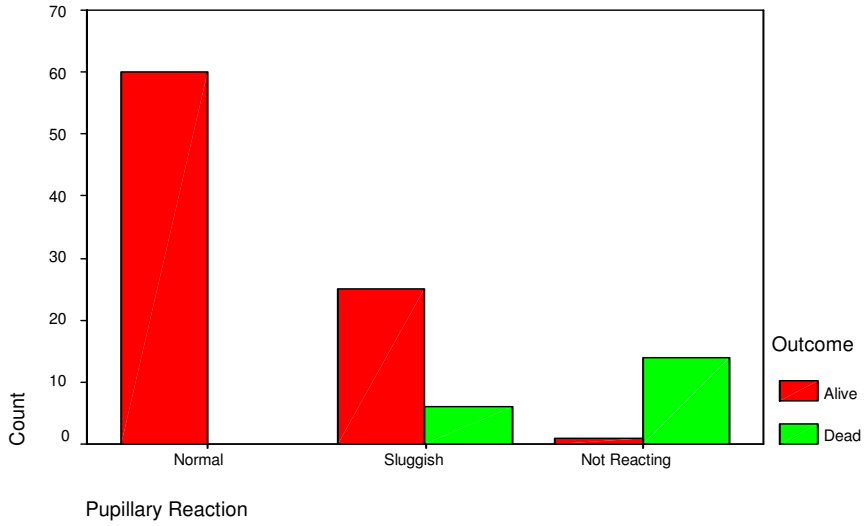
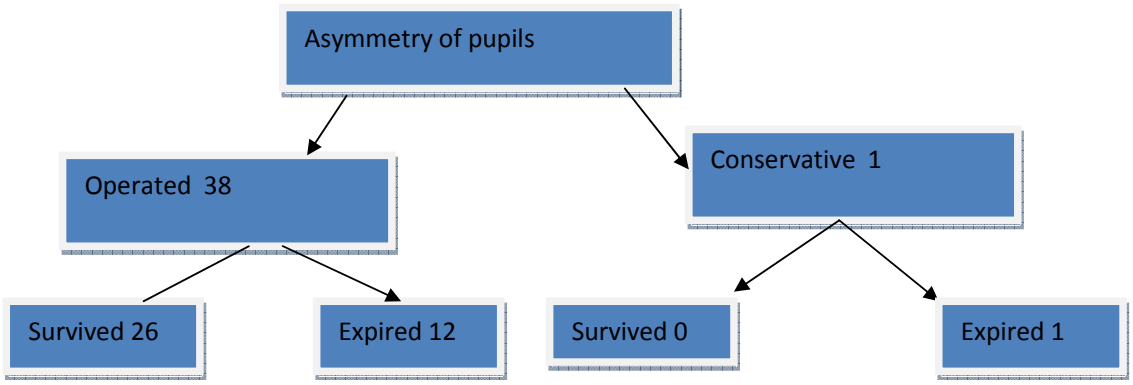


Fig 13.Pupillary Reaction - Outcome

8(a).Asymmetry of pupils



Asymmetry of the pupils (flow chart 2)

Asymmetry of the pupils is noticed in 39 patients. Occulocephalicreflex (OCR) is absent in 6 and impaired in 48 cases. Out of 38 patients with asymmetry operated, 26 survived and 12 expired, the 1 patient conservatively managed expired.

8(b) Symmetry of Pupils * Outcome

Symmetry of Pupils		Outcome		Total	
		Alive	Dead		
Symmetry	Count	59	8	67	p.value .017
	% within Symmetry of Pupils	88.1%	11.9%	100.0%	
	% within Outcome	68.6%	40.0%	63.2%	
Asymmetry	Count	27	12	39	
	% within Symmetry of Pupils	69.2%	30.8%	100.0%	
	% within Outcome	31.4%	60.0%	36.8%	
Total	Count	86	20	106	
	% within Symmetry of Pupils	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 17: 59 patients with pupillary symmetry survived and 8 expired. Out of 39 patients with asymmetry, 27 survived and 12 expired (p.value .017).

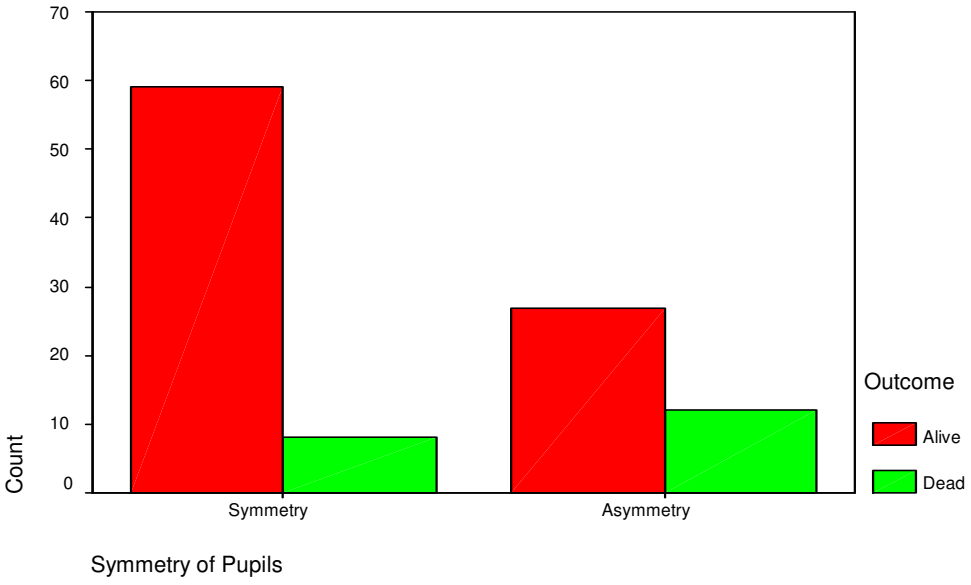


Fig 14.Symmetry of Pupils - Outcome

9(a).Extra Ocular movements

Extra Ocular Movements	
EOM / DEM	**No. of patients**
Normal	**52**
Impaired	**48**
Absent	**6**
Total	**106**

Table 18: Occulo cephalic reflex (OCR) was absent in 6 patients, impaired in 4patients and normal in 52 patients.

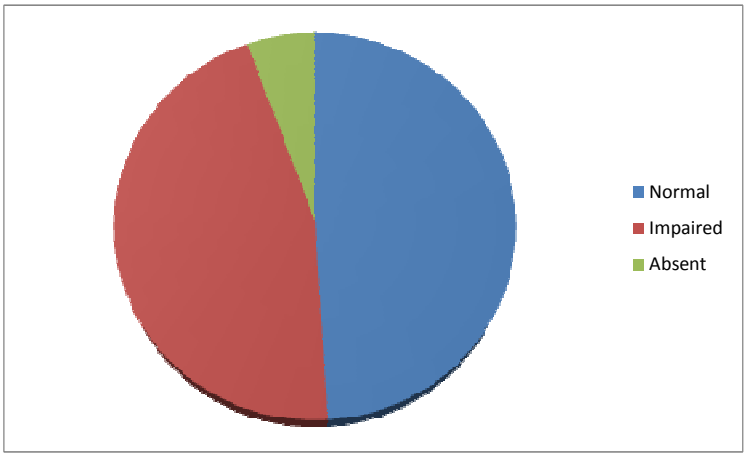


Fig: 15 Doll s eye movements (OCR)

9(b).Extraoccular / Dolls Eye Movement * Outcome

Extraoccular / Dolls Eye Movement		Outcome		Total	
		Alive	Dead		
Normal	Count	52	0	52	
	% within Extraoccular / Dolls Eye Movement	100.0%	0%	100.0%	
	% within Outcome	60.5%	0%	49.1%	
Impaired	Count	34	14	48	
	% within Extraoccular / Dolls Eye Movement	70.8%	29.2%	100.0%	p.value
	% within Outcome	39.5%	70.0%	45.3%	<0.001**
Absent	Count	0	6	6	
	% within Extraoccular / Dolls Eye Movement	0%	100.0%	100.0%	
	% within Outcome	0%	30.0%	5.7%	
Total	Count	86	20	106	
	% within Extraoccular / Dolls Eye Movement	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 19 : In this study, the chi square test shows that Occul cephalic reflex is a significant parameter in the outcome of the traumatic temporal contusion (p value <0.001**)

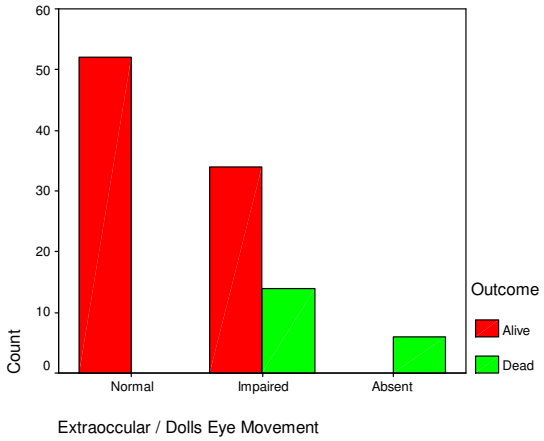


Fig 16 .Extraoccular / Dolls Eye Movement - Outcome

10(a).Pulse rate

PULSE RATE	
Pulse	**No. of patients**
Normal	**68**
Bradycardia	**38**
Total	**106**

Table 20: 68 patients had pulse rate in normal range and bradycardia was noted in about 38 patients.

10(b).Pulse Rate * Outcome

Pulse Rate		Outcome		Total	
		Alive	Dead		
Normocardia	Count	63	4	67	p.value <0.001**
	% within Pulse Rate	94.0%	6.0%	100.0%	
	% within Outcome	73.3%	20.0%	63.2%	
Bradycardia	Count	23	16	39	
	% within Pulse Rate	59.0%	41.0%	100.0%	
	% within Outcome	26.7%	80.0%	36.8%	
Total	Count	86	20	106	
	% within Pulse Rate	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 21: The analysis of the outcome of the patients with bradycardia shows that bradycardia is a significant factor. (p <0.001**)

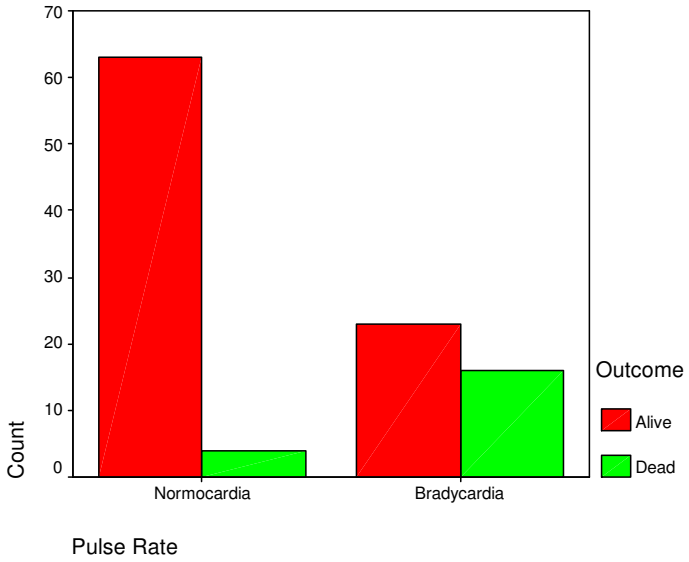


Fig17. Pulse Rate - Outcome

11(a).Side of contusion

Side of the contusion	
Side	**No of patients**
Left	**44**
Right	**62**
Total	**106**

Table 22: Right sided temporal contusion was present in 62 cases and left side contusion in 44 patients.

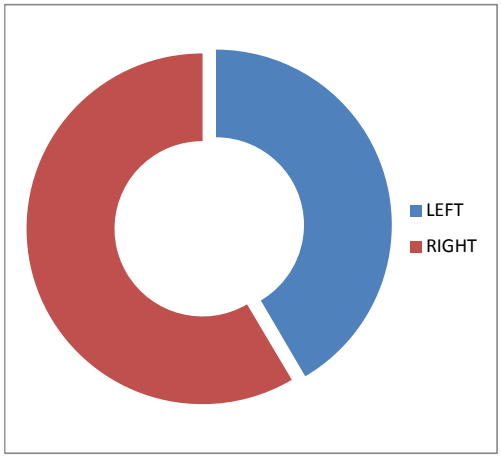


Fig: 18 side of contusion

11(b).Side * Outcome

Side		Outcome		Total	
		Alive	Dead		
Right	Count	47	16	63	P value .038
	% within Side	74.6%	25.4%	100.0%	
	% within Outcome	54.7%	80.0%	59.4%	
Left	Count	39	4	43	
	% within Side	90.7%	9.3%	100.0%	
	% within Outcome	45.3%	20.0%	40.6%	
Total	Count	86	20	106	
	% within Side	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 23: 62 patients have right side temporal lobe contusion and 44 have contusion on the left side(p value .o38)

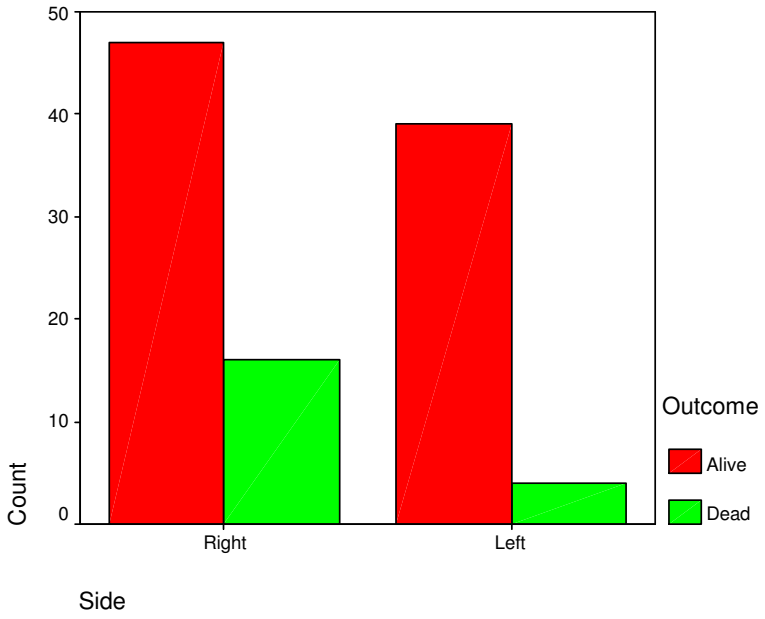


Fig19.Side - Outcome

12(a).Size of the contusion

Size of the contusion	
Size	**No. of patients**
< 10 ML	**53**
11 - 20 ML	**38**
> 20 ML	**15**
Total	**106**

Table 24: By applying the ellipsoid method, the size of the contusion was measured. The volume >20ml was presented in 15 patients, between 11-20 in 38 patients and<10ml in 53 patients.

12(b) Size * Outcome

Size		Outcome		Total	
		Alive	Dead		
< 10	Count	53	0	53	
	% within Size	100.0%	.0%	100.0%	
	% within Outcome	61.6%	.0%	50.0%	
11-20	Count	24	12	36	
	% within Size	66.7%	33.3%	100.0%	P value <0.001**
	% within Outcome	27.9%	60.0%	34.0%	
> 20	Count	9	8	17	
	% within Size	52.9%	47.1%	100.0%	
	% within Outcome	10.5%	40.0%	16.0%	
Total	Count	86	20	106	
	% within Size	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 25: The size of the contusion is a significant factor in the outcome of the patients in this study. (p value <0.001**)

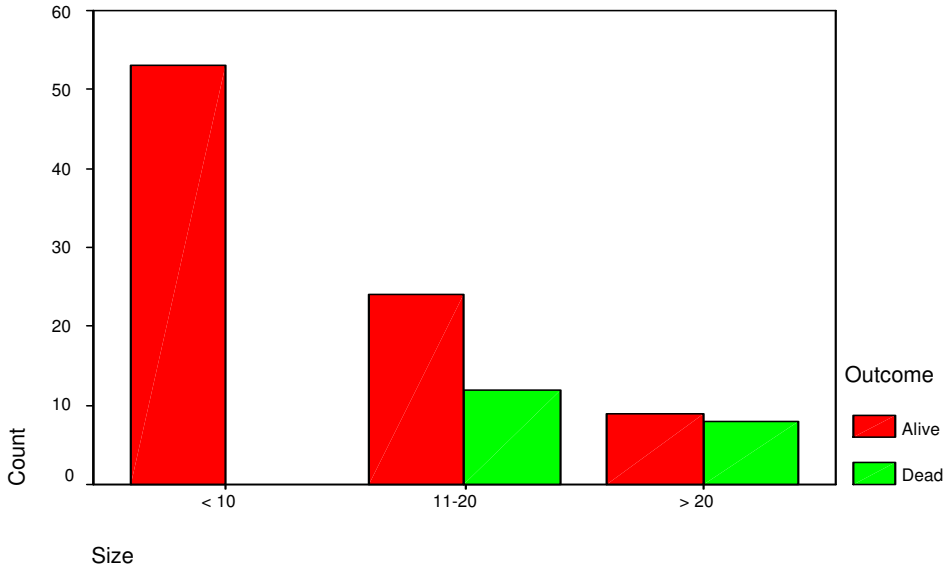


Fig:20 Size * Outcome

13(a) . Mid line Shift - CT Scan Brain

Mid line Shift - CT Scan Brain	
Shift	**No. of patients**
No shift	**52**
< 5 MM	**15**
> 5 MM	**39**
Total	**106**

Table 26: In the CT scan brain there is no midline shift in 52 patients. 39 patients have midline shift more than 5mm.

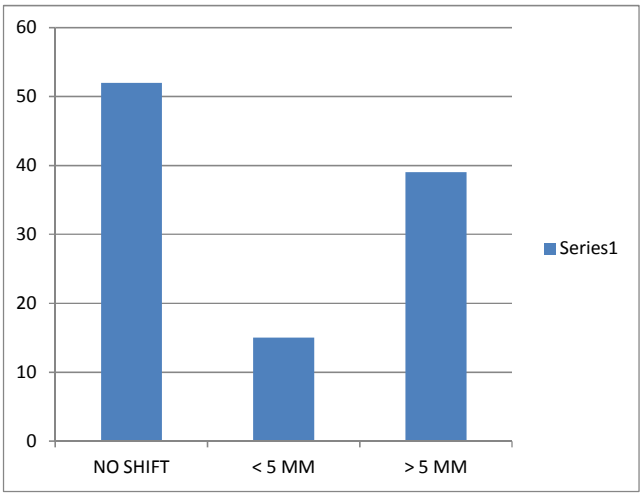


Fig: 21 Midline shift

13(b).Midline Shift * Outcome

Midline Shift		Outcome		Total	
		Alive	Dead		
No Shift	Count	52	0	52	P value <0.001**
	% within Midline Shift	100.0%	0%	100.0%	
	% within Outcome	60.5%	0%	49.1%	
< 5	Count	7	8	15	
	% within Midline Shift	46.7%	53.3%	100.0%	
	% within Outcome	8.1%	40.0%	14.2%	
> 5	Count	27	12	39	
	% within Midline Shift	69.2%	30.8%	100.0%	
	% within Outcome	31.4%	60.0%	36.8%	
Total	Count	86	20	106	
	% within Midline Shift	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 27: On analyzing the outcome of the patients with midline shift in CT brain, this study shows that it is a significant factor**.** (p. value <0.001**)

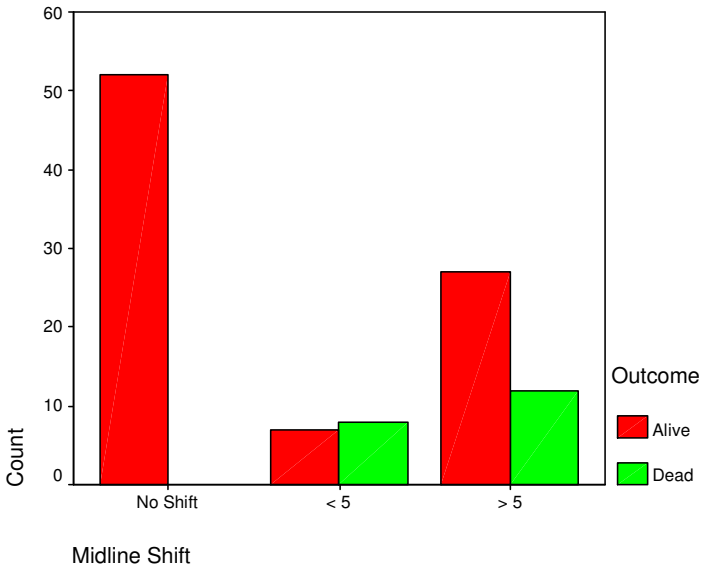


Fig: 22. Midline Shift - Outcome

14(a).Status of the basal cistern

Status of the basal cistern	
Status	**No. of patients**
Open	**50**
Partially effaced	**24**
Fully effaced	**32**
Total	**106**

Table 28: The CT scan brain shows fully effaced cistern in 32 patients, partially effaced in 24 patients and open cistern in 50 patients.

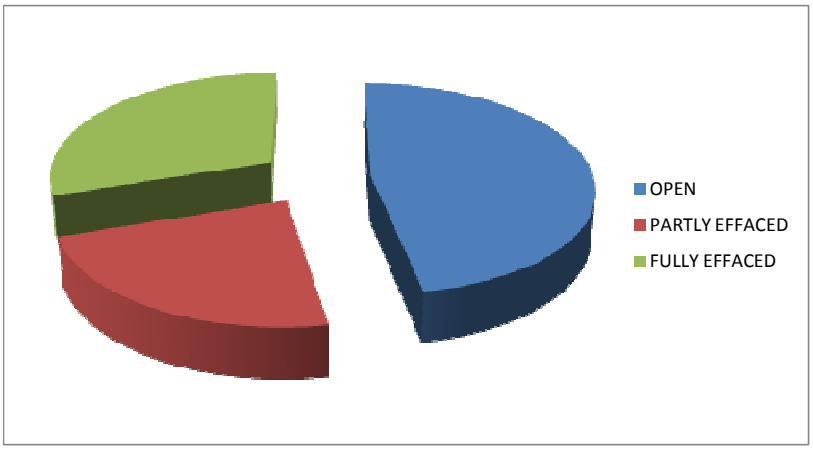


Fig: 23 basal cistern status

14(b).Cisterns * Outcome

Cisterns		Outcome		Total	
		Alive	Dead		
Open	Count	50	0	50	p.value <0.001**
	% within Cisterns	100.0%	0%	100.0%	
	% within Outcome	58.1%	0%	47.2%	
Partly Effaced	Count	23	1	24	
	% within Cisterns	95.8%	4.2%	100.0%	
	% within Outcome	26.7%	5.0%	22.6%	
Fully Effaced	Count	13	19	32	
	% within Cisterns	40.6%	59.4%	100.0%	
	% within Outcome	15.1%	95.0%	30.2%	
Total	Count	86	20	106	
	% within Cisterns	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 29: The status of the basal cistern analysed for the outcome shows that it is asignificant factor. (p.value <0.001**)

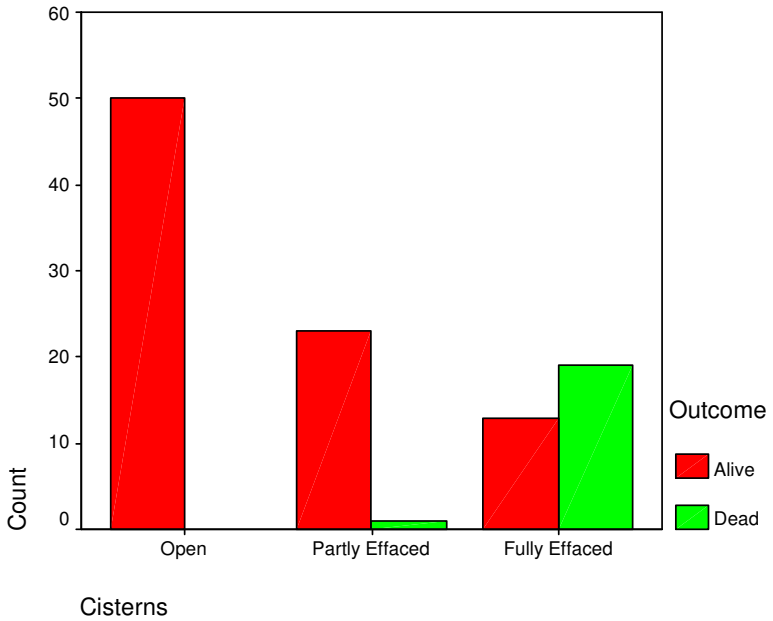
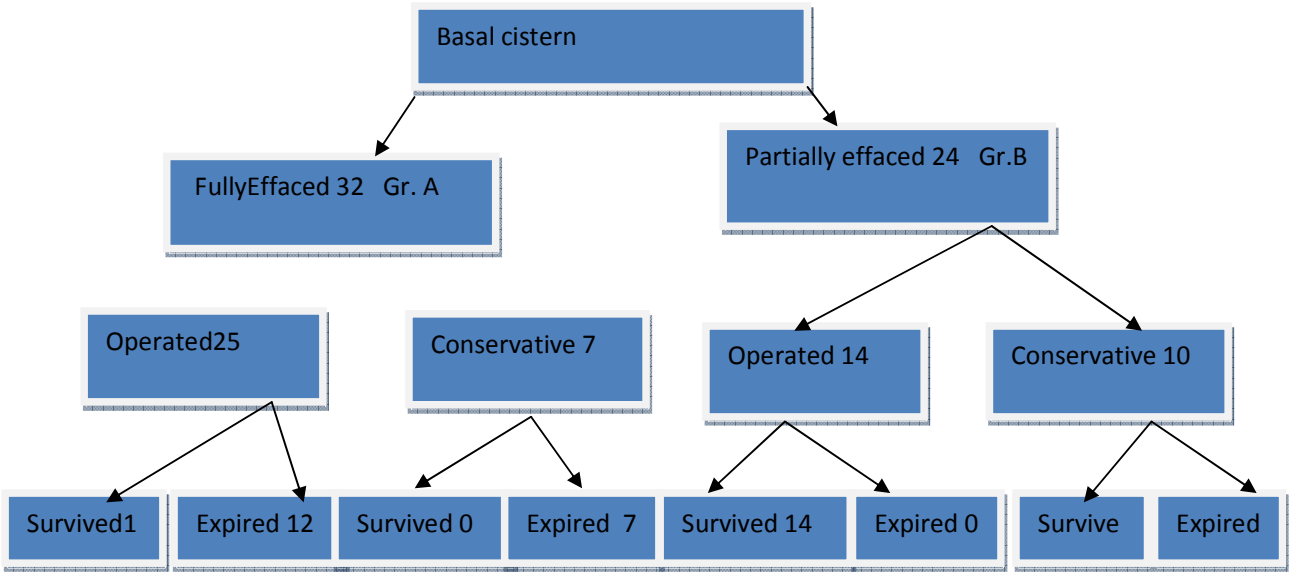


Fig 24.Cisterns - Outcome

14(c). Basal cistern



Flow chart 3: The CT scan brain of 32 pts shows effaced cistern (Group A) and 24 a partially effaced (Group B). The outcome of the patients with the conservative and Surgical management is shown in this flow chart.

15. Management

Management	
Management	**No. of Patients**
Conservative	**67**
Surgery	**39**
Total	**106**

Table 30: 39 patients are managed by surgical procedures and 67 patients are managed conservatively.

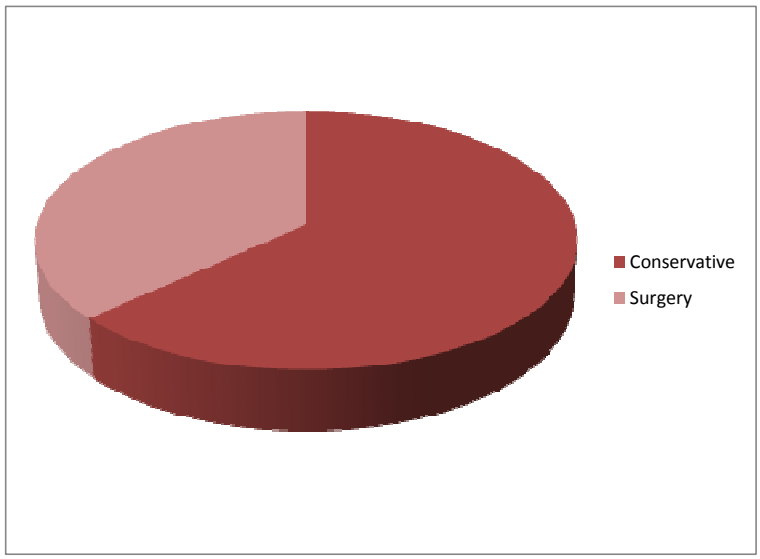


Fig: 25. Management

16. OUTCOME

Outcome	
Outcome	**Total No. of Patients**
Alive	**86**
Expired	**20**
Total	**106**

Table 31: Out of 106 patients treated for traumatic temporal contusion, 86 survived and 20 expired. Among the 20 patients, expired 8 are treated conservatively and 12 have undergone decompressive craniectomy and evacuation of the contusion.

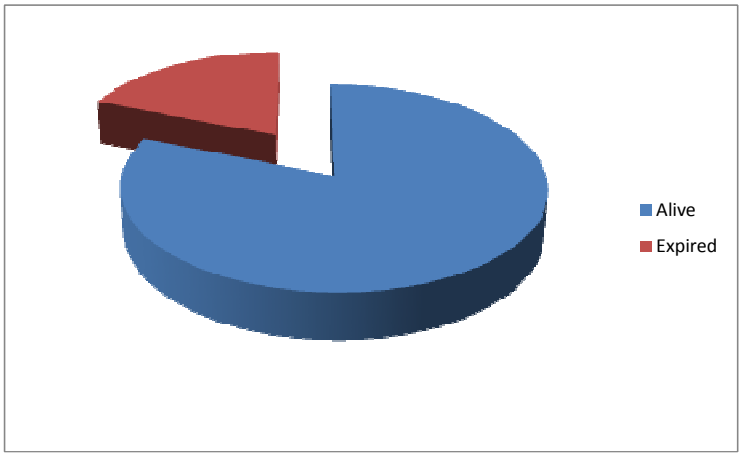


Fig: 26 Outcome

17. Treatment- Outcome

Treatment		Outcome		Total	
		Alive	Dead		
Conservative	Count	59	8	67	p. value .017
	% within Treatment	88.1%	11.9%	100.0%	
	% within Outcome	68.6%	40.0%	63.2%	
Surgery	Count	27	12	39	
	% within Treatment	69.2%	30.8%	100.0%	
	% within Outcome	31.4%	60.0%	36.8%	
Total	Count	86	20	106	
	% within Treatment	81.1%	18.9%	100.0%	
	% within Outcome	100.0%	100.0%	100.0%	

Table 32: This study shows that 69.2% of the patients survived and 30.8% of Patients expired with surgical management. (p. value .017).

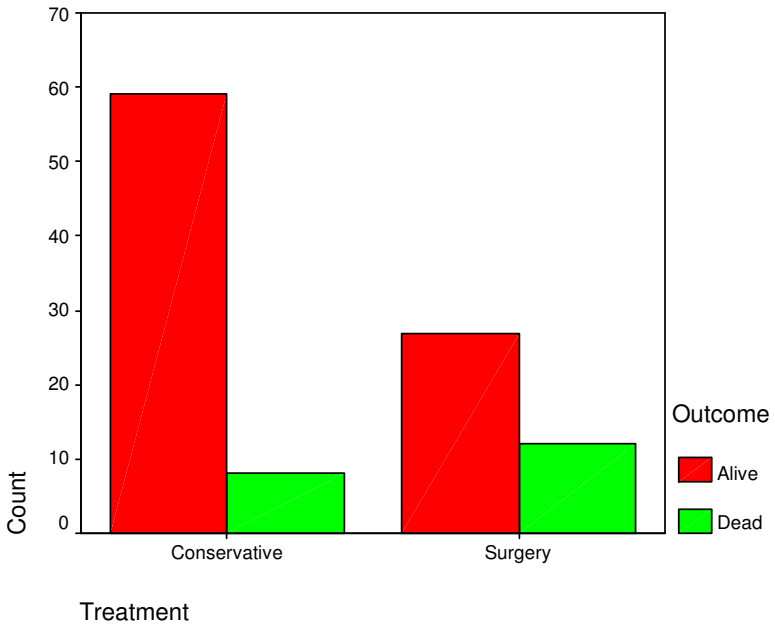


Fig: 27.Treatment - Outcome

ANALYSIS OF THE RESULTS

On analyzing the results of this study,

Motor vehicle accidents are the main mode of head injury. The males who are in the age group between 21-60years are the main victims. But the age, sex, mode of injury does not have significant p value in this study

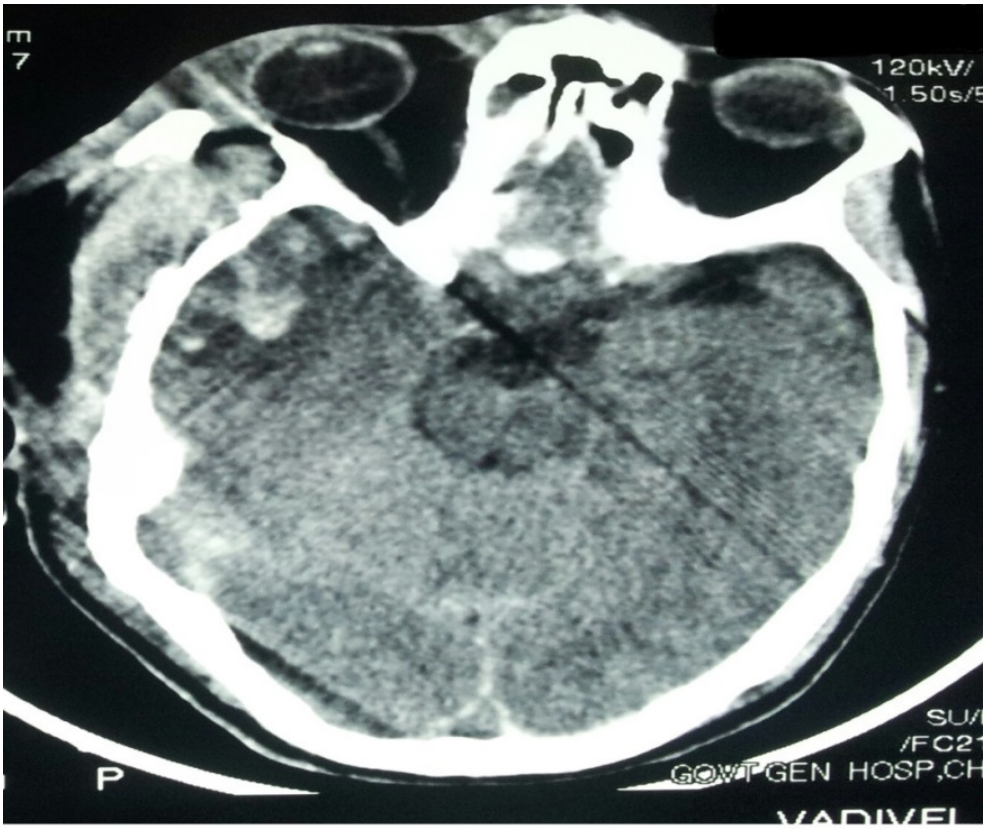
Even though LOC, Vomiting, Seizure and ENT bleed are the clinical features with decreasing order of frequency, this study shows, Seizure as the significant factor for the outcome in patients with traumatic temporal contusion.

This study also shows that low admission GCS and abnormal pupillary response to light, abnormal occulocephalic reflex and bradycardia are significant factors for the outcome of the patients with traumatic temporal contusion.

This study concluded the status of the basal cistern, midline shift more than 5mm and size of the temporal contusion more than 20ml have more significance for the outcome of the head injury patients with temporal lobe contusion.

The outcome of the patients treated by decompressive craniectomy and evacuation of the contusion shows 30.8% mortality and 69.2% survival

.



RIGHT TEMPORAL CONTUSION- COUP INJURY

DISCUSSION

In this study it was observed that road traffic accidents were the common mode of injury .This observation is same as the data given by Transport Research Wing, Ministry of Road Transport and Highways, Road Accidents in India 2011

Most of the victims in MVA were males in the age group of 21-60 in this study. The National Crimes Records Bureau, accidental deaths and suSuicides in India 2012, mentioned that most of the victims in MVA were in the age group 25-65 yrs. (51.9%) and males constitute 85% of them.

This study on post traumatic temporal contusion shows Contre coup temporal contusion was on the higher side, in concurrence with. The study by Tandon PN, 1978, at AIIMS also mentioned that contrecoup contusions were found in most severe head injury patients.

According to Tandon PN, pupillary abnormalities occur in most of the operated cases of temporal contusion, this study also shows pupillary abnormalities were present in most of the patients surgically managed.

Basal cistern effacement were noticed in CT scan brain of most patients with volume more than 30ml.This observation supports Andrews BT , about the effect of intra cerebral hematoma and the risk of brain stem compression.

GCS deterioration was observed in patients with contusion volume between 11-20ml. Choksey, in his retrospective series on the determinants of the outcome in patients with acute intracerebral hematoma mentioned that contusion volume more than 16ml were more prone for deterioration.

As mentioned by Carole L. White in his original article on early progression of traumatic cerebral contusion; characterization and risk factors, in this study ,significant increase in the volume of the contusion was observed in patients with low GCS score.

All of the patients with basal cistern effaced, conservatively treated, expired and patients who were operated had litter better outcome. This also goes well with the Ross Bullock, who mentioned that outcome in basal cistern effacement was worst and surgery must be done irrespective of the GCS of the patients who have basal cistern effacement.

Decompressive craniectomy with evacuation of the contusion is the common surgical procedure performed in patients with temporal contusion. No temporal lobectomy was performed. As mentioned by Motah Mathieu et al. better outcome is noticed in patients who underwent decompressive craniectomy.

CONCLUSION

Temporal lobe contusion occurs usually with MVA. Severe contusions with low GCS score contribute to mortality in such patients.

Patients with head injury in MVA, presenting with seizure, abnormal pupillary response to light, abnormal occulocephalic reflex, bradycardia must have intensive neurosurgical care.

CT scan brain should be done at the earliest. The size of the contusion, the status of the basal cistern and midline shift must be noted to find out the patients who need surgical management. All patients with deteriorating GCS must be evaluated by repeating the CT scan brain and reassess the radiological findings. This help to change the management strategy from conservative to surgical, acting as good clinical markers and lifesaving parameters.

GCS of the patients, abnormal pupillary response to light, abnormal occulocephalic reflex, bradycardia and the radiological findings suggesting size>20ml, status of the basal cistern and midline shift are really useful prognosticators of temporal lobe contusion. Temporal contusion quickly contributes to mortality because of its adjacent location to the brain stem.

Prevention is better than cure. Hence civilians should be strictly instructed to follow the Traffic Regulation rules, drive with appropriate speed .Strict traffic rules should be implemented to prevent MVA, as well as loss to the young lives

REFERENCES

1. Setti S, Rengachary, Robert H Wilkins, Neurosurgery Text Book Ed.2.
2. Ramamurthi and Tandon. Text book of Neuro surgery,Ed.3
3. Tandon PN, Prakash B, Banerji AK,1978, Temporal lobe lesions in head injury. Acta Neuro chirurgica 41, 205-221/1978
4. Gennarelli T, Spielmam, Langfit T. Influence of the type of intracranial lesion on outcome from severe head injury. *J.Neurosurg* 56:26-32,1982.
5. Lobato R, Cordobes F, Rivas J, dela Fuente M, Mor ero, Barcena A. Outcome from severe head injury related to the type of intracranial lesion. A Computerized tomography study. *J.Neurosurg* 59:762-774,1983.
6. BrianT. Andrews Traumatic tentorial herniation and its management.
7. Bullock R, Golck J, Blake G : Traumatic intracerebral haematoma - which patients should undergo surgical evacuation? CT scan features and ICP monitoring as a basis for decision making. *Surg Neurol* 32:181-187, 1989.
8. Surgical management of traumatic parenchymal lesions. Ross Bullock, chapter 5.
9. Yamaki T, Hirakawa K,: Chronological evaluation of acute traumatic intracerebral haematoma. Acta Neurochir 15:33-36,1992.

10. Kofwica Z,Jakubowski J. Acute head injuries in the elderly. An analysis of 136 consecutive patients. A cta Neurochir (wien) 118:98-102,1992.

11. Tseng SH: Reduction to herniated temporal lobe in patiens with sever head injury and uncal herniation. J.Formos Med ASSOC 91:24-28,1992.

12. Surgical management of traumatic parenchymal lesions.Ross Bullock, chapter 5.

13. Choksey M, Crockard HA. Acute traumatic intracerebral hematoma. Determinants of outcome in a retrospective series of 202 cases Br. *J. Neurosurg* 7;611,-622,1993.

14. Munch E, Management of severe traumatic brain injury by decompressive craniotomy. *Neurosurg* 47:315-322,2000.

15. Mathiesan T, Kakarieka A. Traumatic Intracerbral lesions without extracerebral lesions in218 patients. Acta Neurochir 76 (supple) 475-478,2000.

16. Patel N, Hoyt D, NakajiP, Marshall L, Holbrook T. Traumatic brain injury: pattern of failure of non operative management. *J.Trauma* 48:367-374,2000.

17. Carole L White, The journal of trauma (impact factor 2.35) 10/2009;67(3);508-14;discussion 514-5.

18. Alexandre Varella Giannetti, Post- traumatic temporal lobe lesions, Arq Neuro psiquiatr 2005,63(2-B)437-442.

19. Asha Ari ZA 2011, The journal of laryngology and otology (impact Factor. 0.68).04/2011.125(8)781-5 (Salem Faisal,2011,cairo)

20. Gupta Prashant K, JPMS Aug 2011

21. Motah Mathieu et al,2014 Uduma UF, N doumbe Surgical management of severe head injury with cerebral herniation, *j Neuroinfect Dis* 5:136.doi:10.4172/2314-7324-1000136,

22. N Stocchetti,M Croci,F.Resta J Neurol Neurosurg Psychiatry. Jan 2000; 68(1): 14–17.

PROFORMA

Name : **Sex :** **Age :**

Date & Time of injury :

Date & Time of Admission :

Date & Time of Surgery : **IP No** :

Date of Discharge/Death :

Mode of injury :

LOC :

Seizure :

Vomiting :

ENT bleed :

GCS : **E V M**

Pupils : **Reaction to light** : **Anisocoria** :

DEM/EOM :

Heart rate :

CT Scan findings			
Side of contusion			
Site of contusion			
Size of contusion			
Basal cistern			
Midline shift			
Mass effect			
Others			

Management : Conservative/ Surgery

Outcome : Alive/Dead

MASTER CHART

S.NO.	AGE	SEX	MODE	SEIZURE	VOMITING	ENT BL	LOC	AD. GCS	DET. GCS	PUP REA	SYM	EOM	PR	SIDE	TYPE	SIZE	INC SIZE	SHIFT	CIST	TREAT	OUTCOME
				CLINICAL FEATURES										CT SCAN							
1	27	M	RTA	0	0	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
2	60	M	RTA	0	0	0	1	1	0	0	0	0	0	L	1	1	0	0	0	0	A
3	45	M	RTA	0	0	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
4	18	M	RTA	0	1	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
5	22	M	RTA	0	1	0	0	1	0	0	0	0	0	R	2	1	0	0	0	0	A
6	50	M	RTA	1	1	1	1	2	1	2	1	2	1	L	2	2	2	2	2	1	D
7	24	M	RTA	1	1	0	1	2	1	1	1	1	1	L	1	2	2	2	2	1	A
8	51	M	RTA	1	1	0	1	2	1	1	1	1	1	R	1	2	2	2	2	1	A
9	52	M	RTA	1	1	1	1	2	1	2	1	2	1	R	2	2	2	2	2	1	D
10	36	M	RTA	1	1	0	1	2	1	1	1	1	0	R	1	2	1	1	2	0	D
11	27	M	RTA	1	1	0	1	2	1	2	0	1	0	R	1	2	1	1	2	0	D
12	25	M	RTA	1	1	0	1	2	1	2	0	1	0	R	1	2	1	1	2	0	D
13	28	M	RTA	1	1	0	1	2	1	2	0	1	0	L	1	2	1	1	2	0	D
14	37	M	FALL	0	1	0	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
15	21	M	RTA	0	1	0	0	1	0	0	0	0	0	L	1	1	0	0	0	0	A
16	30	M	RTA	0	0	0	1	1	0	0	0	0	0	L	2	1	0	0	0	0	A
17	44	M	RTA	0	0	1	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
18	58	M	RTA	0	1	0	0	1	0	0	0	0	0	R	1	1	0	0	0	0	A
19	26	M	RTA	0	1	0	1	1	0	0	0	0	0	L	1	1	0	0	0	0	A
20	28	M	RTA	0	0	0	0	1	0	0	0	0	0	L	1	1	0	0	0	0	A
21	37	M	RTA	0	1	0	1	1	1	1	1	1	1	R	2	2	2	2	2	1	A
22	60	M	FALL	0	1	0	1	2	1	1	1	1	1	R	2	2	2	2	1	1	A
23	60	M	RTA	0	1	0	1	2	1	1	1	1	1	R	1	2	2	2	1	1	A
24	50	M	FALL	0	1	0	1	1	1	0	1	1	1	L	2	2	2	2	2	1	A
25	26	M	RTA	1	1	0	1	2	1	2	1	2	1	R	2	2	2	2	2	1	D
26	25	M	RTA	1	1	0	0	2	1	1	0	1	0	R	1	2	1	1	1	0	A
27	35	M	RTA	1	1	0	0	2	1	1	0	1	1	R	2	2	1	1	1	0	A
28	65	F	RTA	1	0	0	0	2	1	1	0	1	1	L	2	2	1	1	2	0	D
29	34	M	RTA	0	0	0	0	1	0	0	0	0	0	L	1	1	0	0	0	0	A
30	46	M	RTA	0	0	0	0	1	0	0	0	0	0	L	1	1	0	0	0	0	A

S.NO.	AGE	SEX	MODE	SEIZURE	VOMITING	ENT BL	LOC	AD. GCS	DET. GCS	PUP REA	SYM	EOM	PR	SIDE	TYPE	SIZE	INC SIZE	SHIFT	CIST	TREAT	OUTCOME
				CLINICAL FEATURES										CT SCAN							
31	21	M	FALL	0	0	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
32	51	M	RTA	0	0	0	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
33	32	M	ASS	0	1	1	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
34	35	F	RTA	0	1	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
35	42	M	RTA	0	0	0	1	1	0	0	0	0	0	L	2	1	0	0	0	0	A
36	60	M	FALL	0	1	0	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
37	15	M	RTA	0	1	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
38	31	M	RTA	0	0	1	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
39	33	M	RTA	0	0	0	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
40	75	M	RTA	0	0	1	1	1	0	0	0	0	0	L	2	1	0	0	0	0	A
41	37	M	ASS	0	0	0	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
42	53	M	RTA	1	1	1	1	3	0	2	1	2	1	R	1	3	0	2	2	1	D
43	55	F	RTA	1	1	0	1	2	0	1	1	1	1	L	2	3	0	2	1	1	A
44	32	M	RTA	1	1	0	1	2	0	1	1	1	1	L	2	3	0	2	1	1	A
45	31	M	RTA	0	1	1	1	2	0	2	1	1	1	R	1	3	0	2	2	1	D
46	54	M	RTA	0	0	1	1	2	0	2	1	1	1	R	2	3	0	2	2	1	D
47	71	M	RTA	0	0	0	1	2	1	1	1	1	1	L	1	2	2	2	2	1	A
48	27	M	RTA	0	0	0	1	2	1	1	1	1	1	L	2	2	2	2	2	1	A
49	86	M	RTA	1	1	0	1	1	1	1	1	1	1	R	1	2	2	2	1	1	A
50	40	M	RTA	1	1	0	1	1	1	1	1	1	1	R	2	3	2	2	1	1	A
51	24	M	RTA	1	1	0	1	2	1	1	1	1	1	R	2	3	2	2	2	1	A
52	43	M	RTA	0	1	1	0	2	1	1	0	1	1	R	1	2	1	1	2	0	D
53	41	M	RTA	0	1	0	1	2	1	0	0	1	0	R	2	2	1	1	1	0	A
54	64	M	RTA	0	1	0	1	2	1	1	0	1	0	L	2	2	1	1	1	0	A
55	45	M	RTA	1	1	0	0	3	0	2	1	1	1	R	1	3	0	2	2	1	D
56	27	M	RTA	0	1	1	0	3	0	0	1	1	1	R	1	3	0	2	2	1	A
57	25	M	RTA	0	0	1	1	3	0	0	1	1	1	L	1	3	0	2	1	1	A
58	52	M	RTA	0	0	1	1	2	0	0	1	1	1	R	2	3	0	2	1	1	A
59	30	M	RTA	1	0	0	1	2	0	1	1	1	1	R	1	3	0	2	2	1	D
60	20	M	RTA	0	1	0	1	2	0	0	0	0	0	R	1	1	0	0	0	0	A
61	47	M	RTA	0	1	0	0	2	0	0	0	0	0	R	1	1	0	0	0	0	A
62	15	M	FALL	0	1	1	0	2	0	0	0	0	0	R	2	1	0	0	0	0	A

S.NO.	AGE	SEX	MODE	SEIZURE	VOMITING	ENT BL	LOC	AD. GCS	DET. GCS	PUP REA	SYM	EOM	PR	SIDE	TYPE	SIZE	INC SIZE	SHIFT	CIST	TREAT	OUTCOME
				CLINICAL FEATURES										CT SCAN							
63	63	M	RTA	0	0	0	1	2	0	0	0	0	0	L	1	1	0	0	0	0	A
64	33	M	FALL	0	0	1	0	2	0	0	0	0	0	L	2	1	0	0	0	0	A
65	35	M	ASS	0	1	0	1	2	0	0	0	0	0	R	1	1	0	0	0	0	A
66	56	M	RTA	1	1	0	1	3	0	1	1	1	1	R	1	3	0	2	2	1	D
67	45	F	RTA	1	1	0	1	2	0	1	1	1	1	R	1	3	0	2	2	1	A
68	50	M	RTA	1	1	0	1	3	0	2	1	2	1	R	2	3	0	2	2	1	D
69	23	M	RTA	0	1	0	1	2	0	0	0	0	0	L	1	1	0	0	0	0	A
70	45	M	RTA	0	0	0	1	2	0	0	0	0	0	R	1	1	0	0	0	0	A
71	24	M	FALL	0	1	0	1	2	0	0	0	0	0	R	2	1	0	0	0	0	A
72	60	M	RTA	0	1	0	1	2	0	0	0	0	0	L	2	1	0	0	0	0	A
73	48	M	RTA	0	1	0	1	2	0	0	0	0	0	L	1	1	0	0	0	0	A
74	35	M	RTA	0	1	+	1	2	0	0	0	0	0	L	1	1	0	0	0	0	A
75	38	M	FALL	0	0	0	1	2	0	0	0	0	0	R	1	1	0	0	0	0	A
76	51	M	RTA	1	1	0	1	2	1	1	1	1	1	L	1	2	2	2	1	1	A
77	50	M	RTA	0	1	0	1	2	1	1	1	1	1	R	1	2	2	2	1	1	A
78	59	M	RTA	0	1	0	1	1	1	1	1	1	0	L	2	2	2	2	1	1	A
79	49	M	RTA	0	1	1	1	1	1	1	1	1	0	R	2	2	2	2	2	1	A
80	46	M	RTA	1	1	0	1	2	1	2	1	1	1	R	2	2	2	2	2	1	D
81	64	M	RTA	1	1	0	1	2	1	2	0	1	1	R	2	2	1	1	2	0	D
82	41	M	RTA	1	1	1	1	2	1	1	0	1	0	L	1	2	1	1	1	0	A
83	64	M	RTA	1	1	0	1	2	1	0	0	1	0	L	1	2	1	1	1	0	A
84	65	M	FALL	0	1	0	1	1	0	0	0	0	0	R	2	1	0	0	0	0	A
85	55	M	RTA	0	0	0	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
86	55	M	ASS	0	1	0	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
87	31	M	RTA	0	0	1	1	1	0	0	0	0	0	L	1	1	0	0	1	0	A
88	42	M	FALL	0	1	0	1	1	0	0	0	0	0	R	1	1	0	0	1	0	A
89	54	M	ASS	0	1	1	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
90	48	M	RTA	0	1	0	1	1	0	0	0	0	0	R	1	1	0	0	0	0	A
91	51	M	RTA	1	1	0	1	3	0	2	0	2	1	L	2	3	0	2	2	1	D
92	23	F	RTA	1	1	0	1	2	0	1	1	1	0	L	2	3	0	2	1	1	A
93	17	M	RTA	0	1	0	1	1	1	1	1	1	0	R	2	2	2	2	1	1	A
94	29	M	RTA	0	1	0	1	1	1	0	1	1	0	R	1	2	2	2	1	1	A

S.NO.	AGE	SEX	MODE	SEIZURE	VOMITING	ENT BL	LOC	AD. GCS	DET. GCS	PUP REA	SYM	EOM	PR	SIDE	TYPE	SIZE	INC SIZE	SHIFT	CIST	TREAT	OUTCOME
				CLINICAL FEATURES										CT SCAN							
95	25	M	RTA	1	1	0	1	1	1	0	1	1	1	R	1	2	2	2	2	1	A
96	35	M	RTA	0	1	0	1	1	0	0	0	0	0	L	2	1	0	0	0	0	A
97	40	M	RTA	0	0	0	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
98	48	M	RTA	0	0	1	1	1	0	0	0	0	0	L	1	1	0	0	0	0	A
99	16	M	RTA	0	0	0	1	1	0	0	0	0	0	R	1	1	0	0	1	0	A
100	63	M	RTA	0	0	0	0	1	0	0	0	0	0	R	1	1	0	0	0	0	A
101	36	M	RTA	1	1	0	1	1	1	1	1	1	1	R	2	1	2	2	2	1	A
102	56	M	RTA	0	1	1	1	2	1	2	1	1		R	1	2	2	2	2	1	A
103	25	M	RTA	0	1	1	1	2	1	1	0	1	1	R	1	2	1	1	1	0	D
104	45	M	RTA	0	1	0	1	2	1	1	0	1	0	R	1	2	1	1	0	0	A
105	37	M	RTA	0	0	0	0	1	0	0	0	0	0	L	2	1	0	0	0	0	A
106	28	M	RTA	0	1	1	1	2	0	0	0	0	0	L	2	1	0	0	0	0	A

SEIZURE	0	ABSENT
	1	PRESENT
VOMITING	0	ABSENT
	1	PRESENT
ENT BLEED	0	ABSENT
	1	PRESENT
LOC	0	ABSENT
	1	PRESENT
GCS	3	3 - 8
	2	9 - 12
	1	13 - 15
DET.GCS	0	NO
	1	YES
PUPILLARY REACTION	0	NORMAL
	1	SLUGGISH
	2	NOT REACTING

EOM	0	NORMAL
	1	IMPAIRED
	2	ABSENT
PR	0	NORMOCARDIA
	1	BRADYCARDIA
SIDE	R	RIGHT
	L	LEFT
SIZE	1	<10ML
	2	11 - 20ML
	3	> 30 ML
INC SIZE	0	NO INCREASE
	1	INCREASED BUT < 20 ML
	2	INCREASED > 20 ML

SHIFT	0	NO SHIFT
	1	<5 MM
	2	>5 MM
CISTERN	0	OPEN
	1	PARTLY EFFACED
	2	FULLY EFFACED
TREAT	0	CONSERVATIVE
	1	SURGERY
OUTCOME	A	ALIVE
	D	DEAD
TYPE OF CONTUSION	1	CONTRECOUP
	2	COUP

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. R. Renganathan,
PG in Neuro Surgery,
Department of Neuro Surgery,
Madras Medical College, Chennai-3.

Dear Dr. R. Renganathan,

The Institutional Ethics Committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled **"A Comprehensive Study on Post Traumatic Temporal Contusion in Adults"** No.40032014

The following members of Ethics Committee were present in the meeting held on 11.03.2014 conducted at Madras Medical College, Chennai-3.

1.	Dr. C. Rajendran, M.D.	-- Chairperson
2.	Dr. R. Vimala, M.D. Dean, MMC, Ch-3.	-- Deputy Chairperson
3.	Prof. Kalaiselvi, MD Vice-Principal, MMC, Ch-3	-- Member Secretary
4.	Prof. Nandhini, M.D. Inst. of Pharmacology, MMC, Ch-3.	-- Member
5.	Prof. Bhavani Shankar, M.S. Prof & HOD of General Surgery, MMC, Ch-3.	-- Member
6.	Prof. V. Padmavathi, M.D. I/c Director of Pathology, MMC, Ch-3.	-- Member
7.	Thiru. S. Govindasamy, BABL	-- Lawyer
8.	Tmt. Arnold Saulina, MA MSW	-- Social Scientist
9.	Thiru. S. Ramesh Kumar, Administrative Officer, MMC, Ch-3.	-- Layperson

We approve the proposal to be conducted in its presented form.

Sd/Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

13/3/14

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-

Member Secretary, Ethics Committee

13/3/14.

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சி தலைப்பு

விபத்தினால் ஏற்படும் தலைக்காயம் பற்றிய ஓர் ஆய்வு

ஆராய்ச்சி நிலையம் : **இராஜீவ் காந்தி அரசு பொது மருத்துவமனை,** சென்னை-3.

பெயர் : வயது :

ஆராய்ச்சி சேர்க்கை எண் : தேதி:

பங்கு பெறுபவர் இதனை (✓) குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. ☐

நான் இவ்வாய்வில் தன்னிச்சையாகதான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கின்றேன். ☐

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் 'இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். எனது உடல்நலம் பாதிக்கப்பட்டாலோ அல்லது வழக்கத்திற்கு மாறான நோய்க்குறி தென்பட்டாலோ உடனை அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என்று உறுதி அளிக்கிறேன். ☐

.....	.....	.....
பங்கேற்பாளர் பெயர்	கையொப்பம்/ கைரேகை	தேதி

.....	.....	.....
ஆராய்ச்சியாளரின் பெயர்	கையொப்பம்	தேதி

ஆராய்ச்சி ஒப்புதல் படிவம்

ஆராய்ச்சி தலைப்பு

விபத்தினால் ஏற்படும் தலைக்காயம் பற்றிய ஓர் ஆய்வு

ஆராய்ச்சி நிலையம் : **இராஜீவ் காந்தி அரசு பொது மருத்துவமனை,** சென்னை-3.

பெயர் : வயது :

ஆராய்ச்சி சேர்க்கை எண் : தேதி:

பங்கு பெறுபவர் இதனை (✓) குறிக்கவும்

மேலே குறிப்பிட்டுள்ள மருத்துவ ஆய்வின் விவரங்கள் எனக்கு விளக்கப்பட்டது. என்னுடைய சந்தேகங்களை கேட்கவும், அதற்கான தகுந்த விளக்கங்களை பெறவும் வாய்ப்பளிக்கப்பட்டது. ☐

நான் இவ்வாய்வில் தன்னிச்சையாகதான் பங்கேற்கிறேன். எந்த காரணத்தினாலோ எந்த கட்டத்திலும் எந்த சட்ட சிக்கலுக்கும் உட்படாமல் நான் இவ்வாய்வில் இருந்து விலகி கொள்ளலாம் என்றும் அறிந்து கொண்டேன். ☐

இந்த ஆய்வு சம்பந்தமாகவோ, இதை சார்ந்த மேலும் ஆய்வு மேற்கொள்ளும் போதும் இந்த ஆய்வில் பங்குபெறும் மருத்துவர் என்னுடைய மருத்துவ அறிக்கைகளை பார்ப்பதற்கு என் அனுமதி தேவையில்லை என அறிந்து கொள்கிறேன். நான் ஆய்வில் இருந்து விலகிக் கொண்டாலும் இது பொருந்தும் என அறிகிறேன். ☐

இந்த ஆய்வின் மூலம் கிடைக்கும் தகவல்களையும், பரிசோதனை முடிவுகளையும் மற்றும் சிகிச்சை தொடர்பான தகவல்களையும் மருத்துவர் மேற்கொள்ளும் ஆய்வில் பயன்படுத்திக்கொள்ளவும் அதை பிரசுரிக்கவும் என் முழு மனதுடன் சம்மதிக்கின்றேன். ☐

இந்த ஆய்வில் பங்கு கொள்ள ஒப்புக்கொள்கிறேன். எனக்கு கொடுக்கப்பட்ட அறிவுரைகளின்படி நடந்து கொள்வதுடன் 'இந்த ஆய்வை மேற்கொள்ளும் மருத்துவ அணிக்கு உண்மையுடன் இருப்பேன் என்று உறுதியளிகிறேன். எனது உடல்நலம் பாதிக்கப்பட்டாலோ அல்லது வழக்கத்திற்கு மாறான நோய்க்குறி தென்பட்டாலோ உடனை அதை மருத்துவ அணியிடம் தெரிவிப்பேன் என்று உறுதி அளிக்கிறேன். ☐

.....	.....	.....
பங்கேற்பாளர் பெயர்	கையொப்பம்/ கைரேகை	தேதி

.....	.....	.....
ஆராய்ச்சியாளரின் பெயர்	கையொப்பம்	தேதி

PATIENT CONSENT FORM

Study Details : **"A Comprehensive study on Post Traumatic Temporal Contusion in Adults"**

Study Centre : **Institute of Neurology,**
Madras Medical College and
Rajiv Gandhi Government General Hospital,
Chennai - 600 003.

Patient may check (✓) these boxes:

I confirm that I have understood the purpose of procedure for the above study. I have the opportunity to ask question and all my questions and doubts have been answered to my complete satisfaction. ☐

I understand that my participation in the study is voluntary and that I am free to withdraw at any time without giving reason, without my legal rights being affected. ☐

I understand that the investigator of the clinical study, others working on his behalf, the ethical committee and the regulatory authorities will not need my permission to look at my health records, both in respect of current study and any further research that may be conducted in relation to it, even if I withdraw from the study. However, I understand that my identity will not be revealed in any information released to third parties or published, unless as required under the law. I agree not to restrict the use of any data or results that arise from this study. ☐

I agree to take part in the above study and to comply with the instructions given during the study and faithfully cooperate with the study team and to immediately inform the study staff if I suffer from any deterioration in my health or wellbeing or any unexpected or unusual symptoms. ☐

I hereby give permission to undergo complete clinical examination and diagnostic tests including hematological, biochemical, radiological, EMG, EEG, NCS, Lumbar puncture and muscle biopsy, appropriate to the clinical diagnosis. ☐

I hereby consent to participate in this study. ☐

Signature / Thumb impression: Place : Date :

Patient Name and Address:

Signature of Investigator: Place : Date

Study Investigator's Name :

Information sheet

Name of the Principal Investigator :

Name of the Participant :

Place of Study : Rajiv Gandhi Govt. General Hospital, Chennai-3

- We are conducting a study of **"A Comprehensive study on Post Traumatic Temporal Contusion in Adults"** at the Institute of Neurology, Rajiv Gandhi Govt. General Hospital, Chennai . The purpose is to study posttraumatic temporal lobe contusion in adults based on epidemiology ,clinical features and management. In this study, the outcome of the post traumatic patients with temporal contusion is studied in relation to the age, sex, mode of injury, GCS, Clinical features at presentation, radiological features are analysed.

- The privacy of the patients in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

- Taking part in this study is voluntary. You are free to decide whether to participate in this study or to withdraw at any time. Your decision will not result in any loss of benefits to which you are otherwise entitled.

- The results of the study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of the investigator **Signature of the participant**

Date: Date:

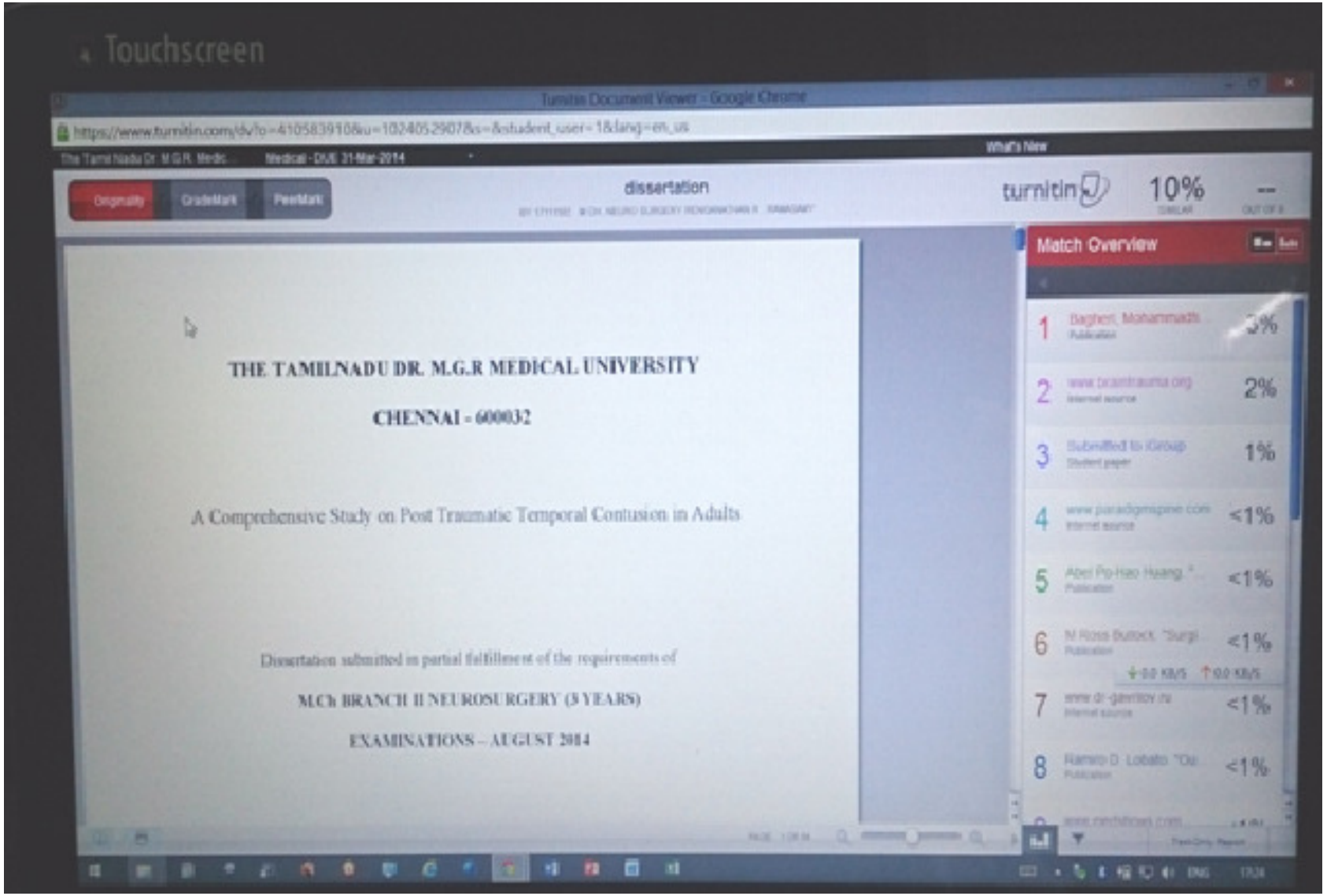
turnitin

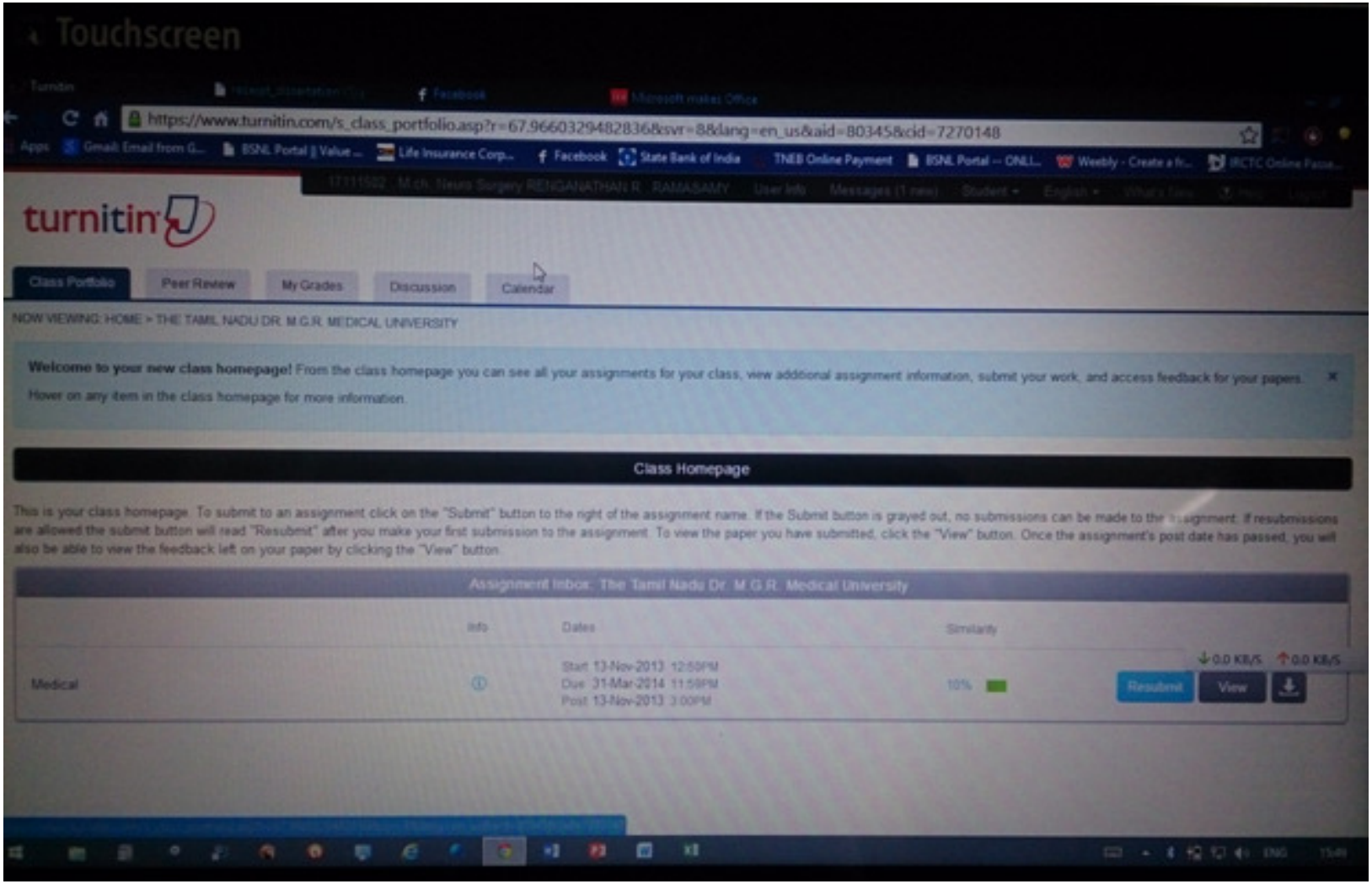
Digital Receipt

This receipt acknowledges that Turnitin received your paper. Below you will find the receipt information regarding your submission.

The first page of your submissions is displayed below.

Submission author:	17111502 . M.ch. Neuro Surgery RENGANATHAN R . RAMASAMY
Assignment title:	Medical
Submission title:	dissertation
File name:	Temporal_Contusion_OP.docx
File size:	1.31M
Page count:	64
Word count:	6,071
Character count:	32,540
Submission date:	28-Mar-2014 03:23PM
Submission ID:	410583910


Touchscreen
Turnitin Document Viewer - Google Chrome
dissertation
turnitin
10%
Match Overview
THE TAMILNADU DR. M.G.R MEDICAL UNIVERSITY
CHENNAI - 600032
A Comprehensive Study on Post Traumatic Temporal Contusion in Adults
Dissertation submitted in partial fulfillment of the requirements of
M.Ch BRANCH II NEUROSURGERY (3 YEARS)
EXAMINATIONS – AUGUST 2014


Touchscreen
https://www.turnitin.com/s_class_portfolio.asp?r=67.9660329482836&svr=8&lang=en_us&aid=80345&cid=7270148
turnitin
Class Portfolio
Peer Review
My Grades
Discussion
Calendar
NOW VIEWING: HOME > THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY
Welcome to your new class homepage! From the class homepage you can see all your assignments for your class, view additional assignment information, submit your work, and access feedback for your papers.
Hover on any item in the class homepage for more information.
Class Homepage
This is your class homepage. To submit to an assignment click on the "Submit" button to the right of the assignment name. If the Submit button is grayed out, no submissions can be made to the assignment. If resubmissions are allowed the submit button will read "Resubmit" after you make your first submission to the assignment. To view the paper you have submitted, click the "View" button. Once the assignment's post date has passed, you will also be able to view the feedback left on your paper by clicking the "View" button.
Assignment Inbox: The Tamil Nadu Dr. M.G.R. Medical University
Info
Dates
Similarity
Medical
Start 13-Nov-2013 12:59PM
Due 31-Mar-2014 11:59PM
Post 13-Nov-2013 3:00PM
10%
Resubmit
View