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CLINICAL AUDIT REPORT ON IV CONTRAST EXTRAVASATION IN CT/MRI PATIENTS

Background of the study: Clinical auditing is a most important aspect of clinical assessment in direct patient care, equipment, instruments, material, infrastructure, methods, standard, quality, quality assurances etc. **Aim of the Audit:** prevent IV site inflammation in MRI and CT prescribed patients**. Goal :** to assess the plain CT therapy IV cannula site Inflammation, To assess the MRI with Contrast patients IV cannula site inflammation. **Method of data collection** : daily base observation methods . type of audit :Quantity base audit . Result of the Audit: By doing this audit process came to know and understand the IV cannula inflammation site and its significance in radiology investigation . in this audit we came to identified the less than 0.2 % of IV cannula inflammation observed **. corrective action :**selection of IV site appropriate to radiological investigation prescribed the concern patients. Monitor by using IV cannula checklist (VIP scale). **Preventive Action :** selection of cannula appropriate size adjust to the age of patients, IV cannulation done by expert Phlebotomy nursing officer. conclusion : In this audit conclude the IV constrast is a sensitive procedure to the patients. So as a health Care provider care of patients to be observed carefully, selection, insertion IV cannula , monitor throughout the procedure were essential part of IV contrast procedure .

1. TITLE OF AUDIT

Study on IV contrast extravasation in CT/MRI patients

2. PROJECT TEAM

a. Dr.Anjalatchi Muthukumaran (Nursing Supt.)

b. Mr. Sudesh Singh Chouhan (DNS)

c. Mr.Vinay Kumar Trivedi (Chief Radiographer)

d. Dr.Surjit Basu(Medical Supt)

e. Mr. Piyush (Biomedical Eng)

f. Mr.Md.Riyaj Ahamd Siddiqui (Quality Coordinator)

3. BACKGROUND

IV Contrast is at times used for CT/ MRI investigations. The contrast is infused with the help of a pressure injector. Flow rate is as per predetermined protocols .The Medication is not pushed by hand.

IV extravasation , which occurs in 1% of cases, causes clinical problems due to patient discomfort, and morbidity. It may result in compartmental syndrome, leading to iatrogenic injury , which is a hospital sentinel event.

4. BEST PRACTICES & EVIDENCE

The review of literature shows that contrast extravasation can be prevented by introducing proper clinical guidelines. The guidelines should specify:

- Screening of patients
- Injection pressure
- Technique of injection
- Size of IV cannula
- Volume of contrast medium injected
- Flow rate of contrast medium
- Other relevant factors

5. AIM, OBJECTIVES AND STANDARDS

Aim: To reduce the number of IV contrast extravasation events in CT/MRI patients

Objectives:

i) To ensure that IV contrast extravasation events in CT/MRI patients are minimized

Standards:

i) IV contrast medium injection medium extravasation should not occur in more than 1% of cases

6. AUDIT PROCESS

Population:

All patients undergoing MRI/ CT investigation with IV contrast medium injection

Population size:

5-10 patients daily

Type of audit:

Prospective audit

Duration of audit:

Nov 2022- Feb 2023

Patient identification:

All patients undergoing MRI/ CT investigation with IV contrast medium injection

Methodology:

A Root Cause Analysis was done for the cases of extravasation.

Based on the known literature and interviews with Radiology Staff, written guidelines were put into place. These are detailed in the document, **"Protocol/Guidelines on Administration of IV Contrast" in ELMCH.**

7. ROOT CAUSE ANALYSIS REPORT

Incident: Extravasation R/T Contrast Injection

Type of Incident: Adverse event

Month: November (3 Incidences)

Department: Radiology, CT Scan Department

QI Formula: Incidence of Extravasation (only number)

Root cause Analysis was carried out by Nursing Quality Nursing Team.

Members Investigated:

1.Dr.Anjalatchi Muthukumaran (Nursing Supt.)

2.Mr. Sudesh Singh Chouhan (DNS)

3.Mr.Md.Riyaj Ahamd Siddiqui (Quality Coordinator)

DESCRIPTION OF THE CASE:

Case 1: Patient X, 59 yrs. Female, UHID , Patient developed Extravasation in the Right Dorsum of Hand due to IV Contrast .Patient is **a K/C/O Cancer and on chemotherapy**, **Patient was receiving chemotherapeutic agent (5 FU) through the same line patient received the Contrast Medium.**

Case 2: It is similar case of extravasation fresh peripheral line inserted by unit in charge; patency was good with back flow. Patient developed swelling along with small blisters.

Case 3: Patient on OPD basis developed extravasation following CT contrast. Peripheral IV line, No 20 was inserted by staff nurse from ER on left hand. **During the procedure while some drug was injected patient developed swelling therefore procedure was stopped**, patient was back to ER where the peripheral line was removed and **a new peripheral line was inserted on the right hand by ER staff nurse and patient sent back to CT department the procedure was carried out by injecting the contrast through the right hand which went smoothly.** Next day the **patient developed massive swelling with large blisters on the left hand (where the procedure was attempted first and stopped in between)**

ROOT CAUSE

Human Factors:

Technician:

1. Lack of Technical competency to **assess S/S of Initial Extravasation (Pain, Redness, Swelling or bulge at the site of infusion)**

2. Lack of communication by the technician about the initial swelling that took place to the nursing quality department
3. Lack of Knowledge on management of Extravasation and awareness of antidotes to be used.
4. Inappropriate usage of Thrombophob (heparin sodium and benzylnicotinate) ointment (On questioning the senior technician on antidotes for extravasation he replied that thrombophob (heparin sodium and benzyl nicotinate) is used, which is actually a wrong concept.

Nurses: Skill in Insertion of intravenous line in case of Inpatient clients and documentation of the IV Line patency.

Process of Drug Administration:

IV Contrast is infused with the help of a high pressure pump. Flow rate is 3ml/sec over 30 secs on the dorsum of the hand. The Medication is not pushed by hand

Equipment:

Machine calibration details were not known to the Sr. Technologist.

8. RECOMMENDATION

Management of Extravasation as per protocol from the Nursing Clinical practice manual

Protocol/Guidelines on Administration of IV Contrast

Improving communication between radiologist and nursing quality department (Tissue viability nurse and Patient safety nurse).

Immediate stopping of procedure on initial signs of symptoms of extravasation

Preparation of protocol for guidelines on administration of IV contrast. Guidelines on process of administration and method to be used, type of dye, type of vein flow to be selected in relation to patient's age, diagnosis and venous status of the patient. Protocol should define clearly, when machines should be checked and calibrated.

Certified training program for the CT Technicians.

Review material data sheet of drugs.

Incorporate as indicator in the iatrogenic injuries

CONCLUSION

- Quality Indicator on extravasation was initiated after the above three incidences which happened in November 2022. Many action plans were adopted at the time of incident, to bring down the incidence.
- Teaching to the radiology staff on management of extravasation as per the protocol from the Nursing Clinical Practice Manual

- Improving communication between radiologist & nursing quality department incase of warning signs of extravasation.
- Material data sheet for drugs was revised.
- Thereby the incidence of extravasation has been zero for the past 6 months, indirectly improving the quality of care.

Protocol/Guidelines on Administration of IV Contrast in ELMCH

Purpose of the Policy: To ensure safety in administration of Intravenous Contrast media among patient undergoing contrast procedures at ELMCH

Scope of Policy: This policy applies for all areas in the Department of Radiology where contrast media is given.

Policy applies to:

1. Radiology technologist (RT) who administer intravenous contrast media
2. Nurse who transfers the patient to the area of Procedure
3. Physician who has advised the Procedure

Procedure of administration:

1. The requisition form for the exam with pertinent indication for the procedure signed by the physician dated and timed must be made available along with the patient accompanied with a nurse and a Runner girl who wheels the patient into the Radiology department.
2. Upon arrival to the department, the patient completes the "Patient Screening Form For Contrast media"
3. Radiology technicians administering intravascular contrast media must first assess the patient for risk factors predisposing them to adverse reactions. The patient (or their parent/guardian in case of a minor or unconscious patient) is assessed for the following :

- Previous reactions to contrast media.
- All severe allergies and reactions (both medications and food).
- Age 60 years or over.

- History of diabetes, kidney disease, pheochromocytoma, solitary kidney, kidney or other transplant, or myeloma.
- Current use of any metformin-containing medications.
- For women of child-bearing age, if they are or may be pregnant or if they are breast-feeding.
- The technologist reviews the form and enters the date and value of the most recent Glomerular filtration rate (GFR), Creatinine levels, BUN.

4. The RT reviews the completed form and notifies the Radiologist of any contraindications or risk factors noted. The pharmacist will be consulted as necessary.
5. The RT questions the patient regarding their expectations, explains the procedure and reassures the patient. The patient should be offered the opportunity to speak with a radiologist if questions persist or anxiety seems pronounced as most patients have some degree of anxiety and fear concerning imaging procedures.
6. The RT check orders for contrast administration, Dosage is determined by body weight per manufacturer's recommendations.
7. The Technician will verify the ten rights (Right patient, Right drug, Right dose, Right route, Right time, Right assessment, Right documentation, Right Drug to Drug interaction Knowledge, Right Drug to Food interaction Knowledge and Right evaluation).
8. The RT assesses for Transient minor reactions such as warm flushing and altered sense of taste are common. Before beginning injection, The RT explains that these may occur and reassures the patient.
9. The patency of the IV catheter is checked by flushing with 0.9% normal saline (using the injector at the same rate as the actual contrast injection). If there is resistance, pain, or the catheter does not flush, do not proceed. Otherwise, connect the fluid filled high-pressure tubing to the catheter at the hub closest to the catheter. Contrast flow is manually test to ensure patency.
10. Proceed with contrast injection. –injection sample for contrast CT/MRI scanning

Type of Procedure	Size of Cannula	Flow rate of Contrast (ml/sec)	Volume to be Infused
Coronary Angiography	18 G	5.5	Total (80 to 100 ml) Drug volume calculated as 1.5 ml per Kg for Adults & 0.7 to 1 ml per Kg for pediatric patients
Hepatic Angiography	18G	4.5	90 to 120 ml
Lower Limb angiography	18G	4 to 4.5	150 ml
Other Angiography	18G	4 to 4.5	80 to 100 ml
Routine CT (For Normal Veins)	20G	3 to 3.5	
For Thin Veins	22G		
For pediatric Patients	24G/26G		

11. At the completion of the injection, the catheter is flushed with 10cc 0.9% normal saline, the high-pressure tubing is disconnected, and the IV site is inspected for any swelling or indication of extravasation. The patient is observed for any indications of contrast reaction.
12. The supervising physician must be physically present in the facility or office suite and available in order to provide immediate medical intervention to prevent or mitigate injury to the patient in the event of an adverse reaction.
13. Iodinated contrast media are pharmaceuticals and have potentially dangerous and life-threatening adverse reactions.
14. Safe intravenous access, for the injection of intravenous contrast, is vital in obtaining high quality contrast enhanced or angiographic studies. Proper technique is used to avoid the potentially serious complications of contrast media extravasation and/or air embolism. When the proper technique is used,

contrast medium can safely be administered intravenously by power injector, at high-flow rates of up to 5 mls/second.

15. A short peripheral IV catheter in the antecubital or forearm area is the preferred route for contrast administration. However other routes may need to be used and each is considered separately below. The follow flowchart will assist in the decision of obtaining proper venous access for contrast administration
16. Most major and minor reactions will occur in patients without any known risk factors. Virtually all life-threatening reactions occur immediately or within 20 minutes after contrast injection.
17. All areas where contrast is given must be equipped with an emergency anaphylactic box containing supplies required for the treatment of contrast reactions.
18. Protocol for assessment and selection of Venous access for Intravenous Administration of Contrast Agents for Enhanced CT or MR Scans in Adults.

Management of Extravasation:

Definition: Extravasation contrast media are toxic to the surrounding tissues, particularly to the skin, producing an acute local inflammatory response that sometimes peaks in 24 to 48 hours. The acute tissue injury resulting from extravasation of contrast media is possibly related primarily to the hyper-osmolality of the extravasated fluid. Despite this, the vast majority of patients in whom extravasations occur recover without significant sequelae. Only rarely will a low-osmolality contrast media (LOCM) extravasation injury proceed to a severe adverse event.

Most extravasations are limited to the immediately adjacent soft tissues (typically the skin and subcutaneous tissues). Usually there is no permanent injury. The most commonly reported severe

injuries after extravasation of LOCM are compartment syndromes. A compartment syndrome may be produced as a result of mechanical compression. A compartment syndrome is more likely to occur after extravasation of larger volumes of contrast media; however, it also has been observed after extravasation of relatively small volumes, especially when this occurs in less capacious areas (such as over the ventral or dorsal surfaces of the wrist).

Less commonly, skin ulceration and tissue necrosis can occur as severe manifestations and can be encountered as early as six hours after the extravasation has occurred.

Causes for extravasation:

1. May depend on the technique (injection of large volumes or at a fast rate through the infusion pump) or on the patients characteristics

2. The main reasons involved in the increase of accidental extravasation of contrast volumes exceeding 50 ml are the use of rapid infusion pumps and the increase in the use of CT scans in monitoring cancer patients. These patients, often under chemotherapy, should be particularly monitored at the time of contrast infusion, especially if the IV line is on the dorsum of the hand, since chemotherapy induces fragility of the vein wall which can lead to the vessels rupture when starting a rapid infusion.

Patient's characteristics

Patients at Increased Risk for Extravasations

- Patients cannot communicate adequately (e.g., the elderly, infants and children, and patients with altered consciousness)
- Severely ill or debilitated patients
- Patients with abnormal circulation in the limb to be injected.
- Patients with altered circulation include those with Atherosclerotic peripheral vascular disease,
- Diabetic vascular disease,
- Raynaud's disease,
- Venous thrombosis or insufficiency,
- Prior radiation therapy or extensive surgery (e.g., axillary lymph node dissection or saphenous vein graft harvesting) in the limb to be injected.

Patients at Increased Risk for a Severe Extravasation Injury Once an Extravasation Occurs:

- Arterial insufficiency or compromised venous or lymphatic drainage in the affected extremity.
- Extravasations involving larger volumes of contrast media and those occurring in the dorsum of the hand, foot, or ankle are more likely to result in severe tissue damage.

Indicated for selection of venous Access:

1. Peripheral IVs
2. PICCS (peripherally inserted central catheters)
3. Chest Ports
4. Central Lines
5. IV cannulas inserted into the Internal or External Jugular Vein

Contraindicated line:

1. Dialysis catheters should not be used to administer contrast agents
2. Certain intravenous access sites (e.g., hand, wrist, foot, and ankle) are more likely to result in extravasation and should be avoided if possible.
3. Injection through indwelling peripheral intravenous lines that have been in place for more than 24 hours and multiple punctures into the same vein are associated with an increased risk of extravasation

Management of Extravasation:

SR. NO	MANAGEMENT	RATIONALE
1	Initial assessment of patients who have suffered contrast media extravasation	Signs and symptoms that were present initially have improved or that new symptoms have not developed during the observation period.
2	Hand Elevation of the affected extremity above the level of the heart	To decrease capillary hydrostatic pressure and thereby promote resorption of extravasated fluid is recommended.
3	Warm Application	Improving absorption of the extravasation as well as in improving blood flow, particularly distal to the site.
4	Cold Application	Relieving pain at the injection site.
	Local Aspiration	To aspirate the extravasated contrast medium through an inserted needle or angiocatheter,
5	Local Infiltration /Injection	Local injection of other agents such as corticosteroids or hyaluronidase. (enzyme that breaks down the connective tissue and helps the absorption of extravasated drugs by the vascular and lymphatic systems)
6	Patient Education	Clear instructions should be given to the patient to seek additional medical care, should there be any worsening of symptoms, skin ulceration, or the development of any neurologic or circulatory symptoms, including paresthesias.
7	Surgical consultation prior to discharge should be obtained whenever there is	1. Indicated for any patient in whom one or more of the following signs or symptoms develops progressive swelling or pain, altered tissue perfusion as evidenced by decreased capillary refill at any time after the extravasation has occurred, change in sensation in the affected limb, and skin ulceration or

	concern for a severe extravasation injury.	blistering. 2. Surgical consultation should be obtained automatically for any large volume extravasations, particularly those estimated to be in excess of 100 ml; however, more recently it has been suggested that reliance on volume threshold is unreliable and that the need for surgical consultation should be based entirely on patient signs and symptoms. 3. Urgent surgical drainage and aspiration of contrast performed in the first 6 hours has been effective when a compartment syndrome has occurred in cases of large extravasations

Prevention of Extravasation:

1. The risk of extravasation can be reduced by the use of non-ionic contrasts of lower osmolarity which produce less direct tissue damage than ionic contrasts of higher osmolarity.
2. Direct supervision of infusion pumps or the use of devices that can detect early extravasation through impedance are useful.
3. Larger veins found at the antecubital fossa are recommended sites for intravenous access and appropriate catheter gauge should be considered to withstand infusions.
4. Clear instructions should be given to the patient to report of any pain or any discomfort at the site of injection.

Documentation: In Medical Record File (Progress Notes, Nurses Notes), Occurrence and Incident Reporting form.

Reporting the Incident:

In case of extravasation or a doubt of extravasation contact the patient safety Nurse or the Tissue Viability Nurse on No provided in the Department

CORRECTIVE & PREVENTIVE ACTIONS

Corrective Action

1. Implementation of Protocol/Guidelines on Administration of IV Contrast" in ELMCH.

2. Improving communication between radiologist and quality department (ANS and NS) for immediate action both actual and potential to the issue

3. Immediate stopping of procedure on initial signs of symptoms of extravasation and implementing post extravasation measures as a part of Nursing Care Eg. Elevation, cold compress etc…

4. Review material data sheet of drugs

5. Preventive maintenance of the equipment and periodic calibration check

Preventive Action

1. Management of Extravasation as per protocol from the Nursing Clinical practice manual

2. Ongoing training and audit based on Protocol/Guidelines on Administration of IV Contrast" in ELMCH.

3. Update protocol for guidelines on administration of IV contrast. Guidelines on process of administration and method to be used, type of dye, type of vein flow to be selected in relation to patient's age, diagnosis and venous status of the patient. Protocol should define clearly, when machines should be checked and calibrated.

4. Certified training program for the CT Technicians.

5. Incorporated as indicator in the iatrogenic injuries immediate reporting to Nursing Quality team and monthly reporting to Quality Department GHC

6. Continuous monitoring and improvement

DATA ANALYSIS AND INTERPRETATION OF CT AND MRI CONTRAST BASE IV EXTRAVASATION CASES PERCENTAGE

s.no:	Month	Plain	Contrast	Total	Extravasation		% plain	% Contrast	Total %
					No Of	%			
1	May 22								
	No.of.CT	276	102	378	02	1053%	73.02%	26.98%	100%
	No.of MRI	231	10	241	01	0.41%	95.85%	4.15%	100%
2.	June 22	Plain	Contrast	Total	Extravasation		% plain	% Contrast	Total %

	No Of CT	290	115	405	3	0.74%	71.6%	28.4%	100%
	No Of MRI	284	305	305	2	0.66%	93.11%	6.89%	100%
3.	July 22								
	No Of CT	285	117	402	2	0.50%	70.90%	29.10%	100%
	No Of MRI	264	19	283	2	0.71%	93.29%	6.71%	100%
4.	Aug 22								
	No Of CT	295	122	417	3	0.72%	70.74%	29.26%	100%
	No Of MRI	17	270	270	2	0.74%	93.70%	6.36%	100%
5.	Sep 22								
	No Of CT	298	125	423	2	0.47%	70.45%	29.55%	100%
	No Of MRI	265	15	280	2	0.71%	94.64%	5.36%	100%
6.	Oct 22								
	No Of CT	302	130	432	3	0.69%	69.91%	30.09%	100%
	No Of MRI	272	21	293	3	1.02%	92.83%	7.17%	100%
7.	Nov 22								
	No Of CT	463	135	598	0	0.00%	77.42%	22.58%	100%
	No Of MRI	295	17	312	0	0.00%	94.55%	5.45%	100%
8.	Dec 2022								
	No Of CT	553	161	714	02	0.28%	77.45%	22.55%	100%
	No Of MRI	289	32	321	02	0.62%	90.03%	9.97%	100%
9.	Jan 23								
	No Of CT	494	120	614	3	0.49%	80.46%	19.54%	100%
	No Of MRI	263	30	293	2	0.68%	89.76%	10.24%	100%

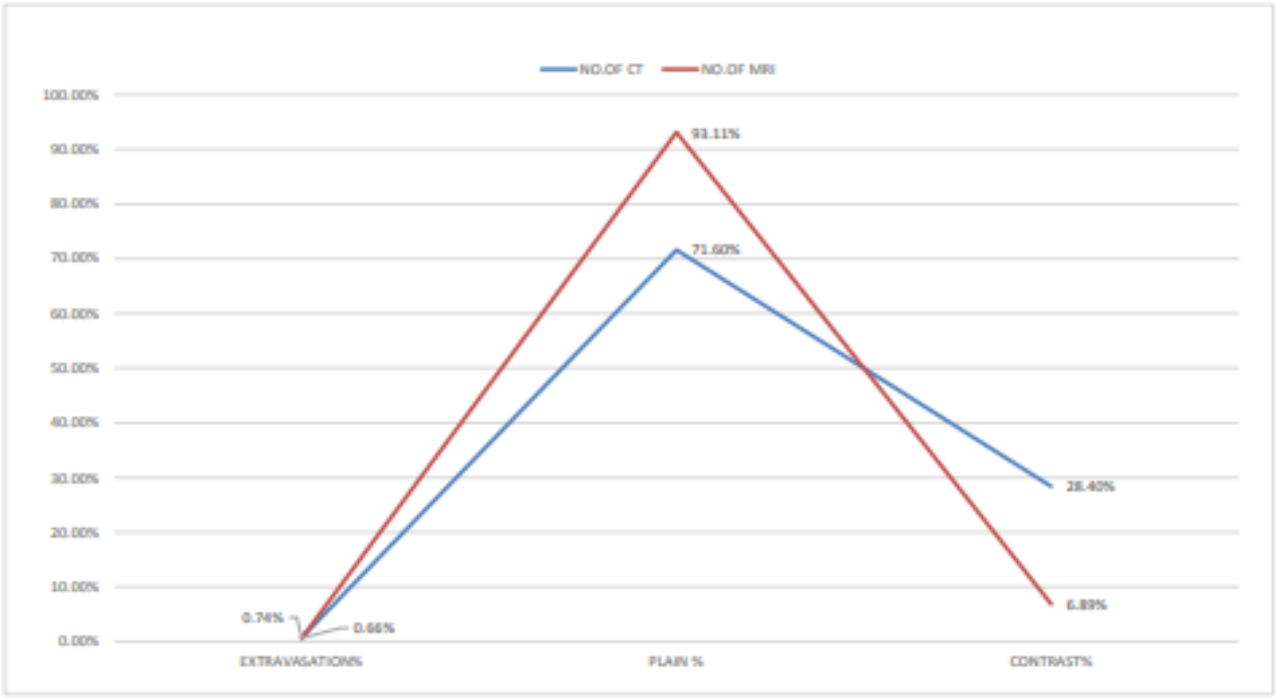
10.	Feb 23								
	No Of CT	324	141	465	2	0.43%	69.68%	30.32%	100%
	No Of MRI	335	35	370	3	0.81%	90.54%	9.46%	100%
11.	Mar 23								
	No Of CT								
	No Of MRI								
12.	April 2023								
	No Of CT								
	No Of MRI								
	Total :								

DATA ANALYSIS AND INTERPRETATION OF CT AND MRI CONTRAST BASE IV EXTRAVASATION CASES PERCENTAGE

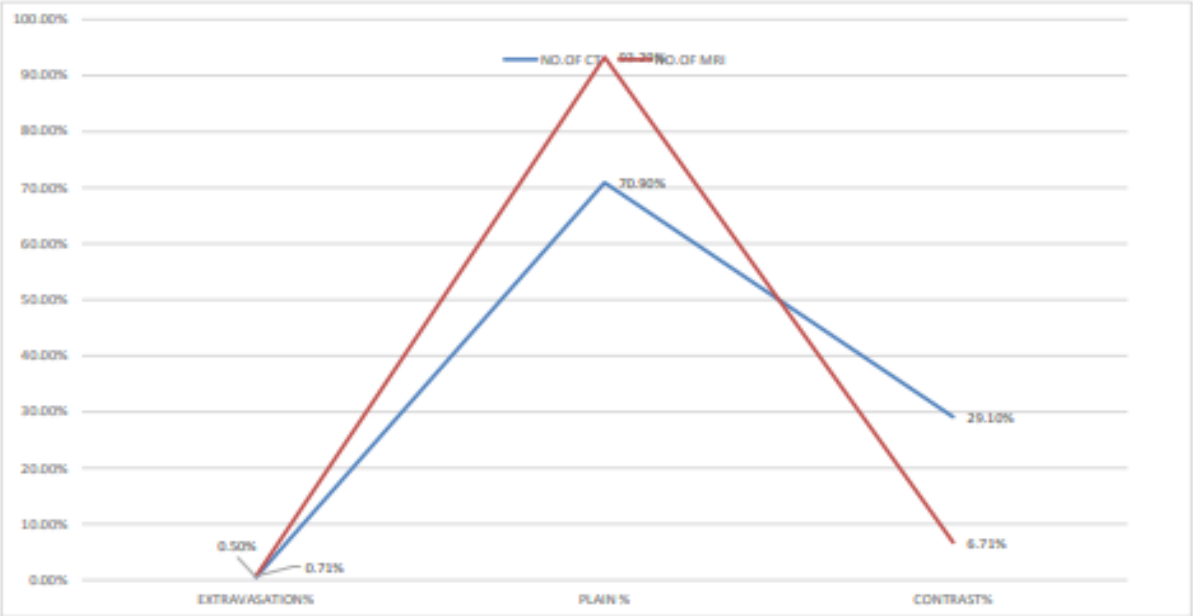
RADIOLOGY DEPARTMENT

MONTH:- MAY 2022	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	276	102	378	2	0.53%	73.02%	26.98%	100.00%
NO.OF MRI	231	10	241	1	0.41%	95.85%	4.15%	100.00%

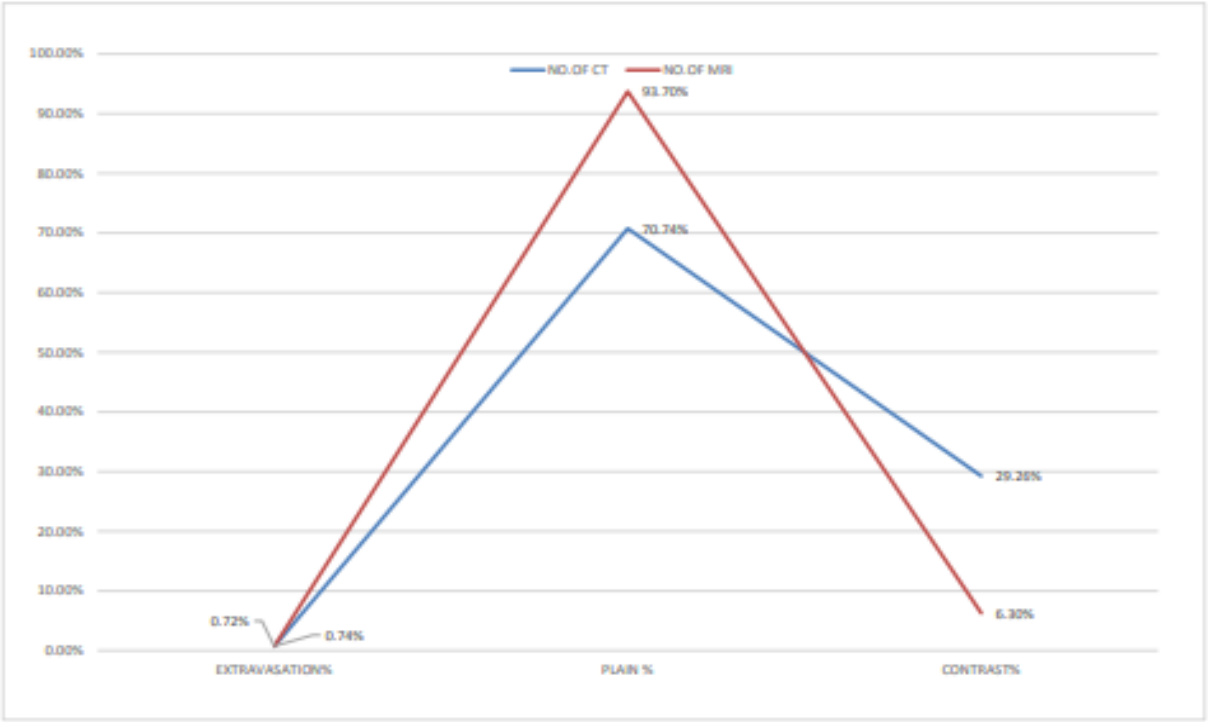
MONTH:- June 2022	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	290	115	405	3	0.74%	71.60%	28.40%	100.00%
NO.OF MRI	284	21	305	2	0.66%	93.11%	6.89%	100.00%



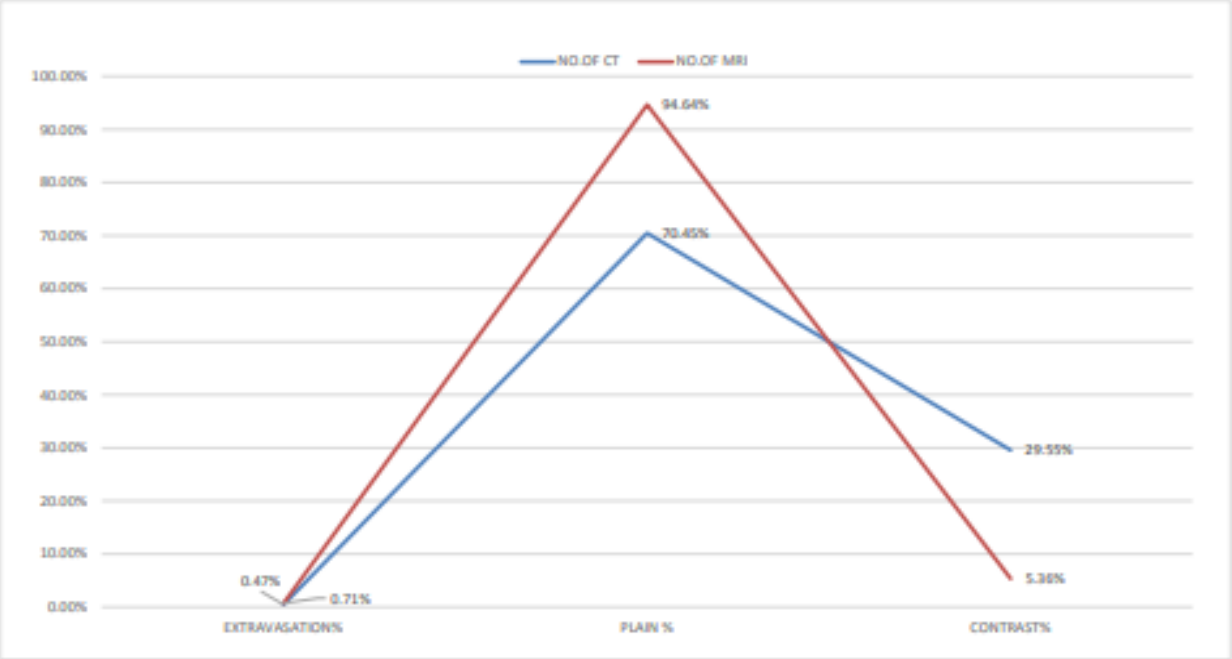
MONTH:- July 2022	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	285	117	402	2	0.50%	70.90%	29.10%	100.00%
NO.OF MRI	264	19	283	2	0.71%	93.29%	6.71%	100.00%



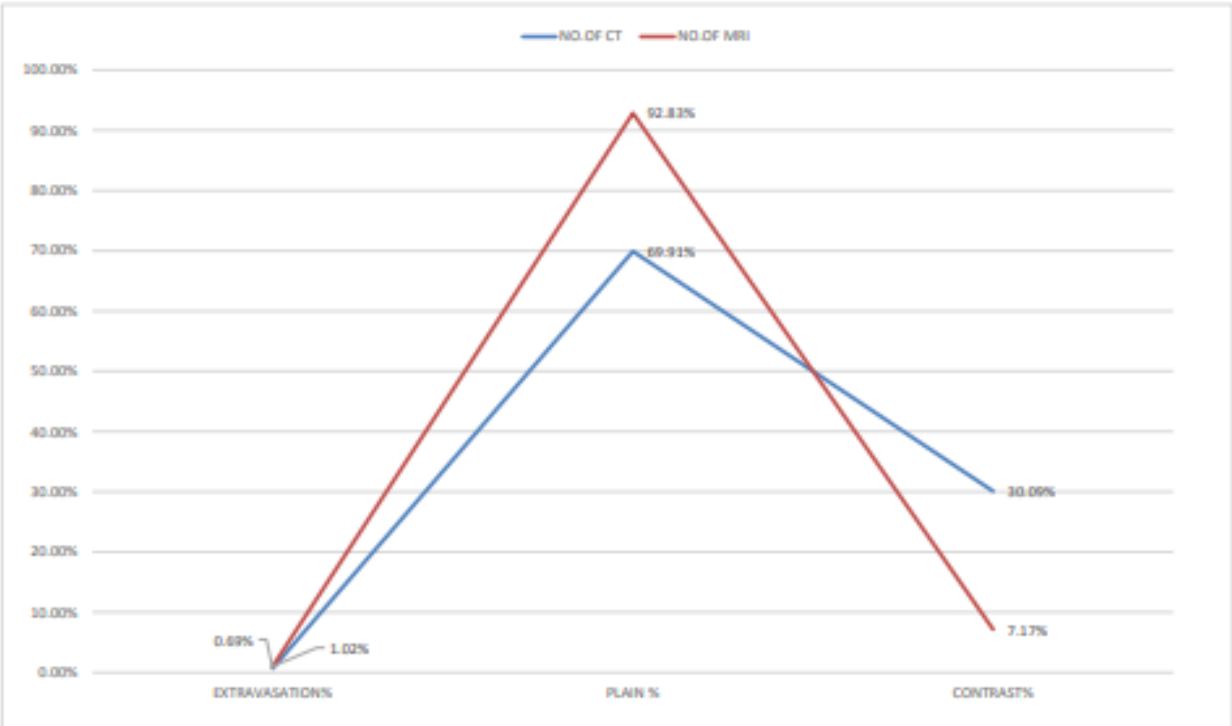
MONTH:- AUGUST 2022	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	295	122	417	3	0.72%	70.74%	29.26%	100.00%
NO.OF MRI	253	17	270	2	0.74%	93.70%	6.30%	100.00%



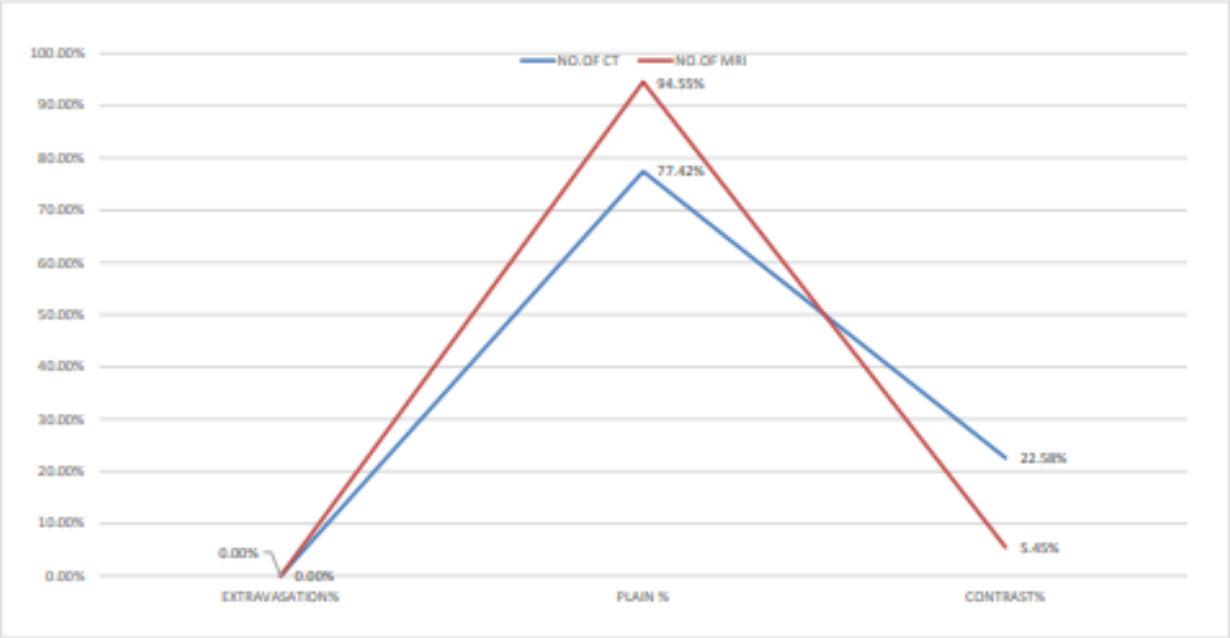
MONTH:- SEPTEMBER 20	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	298	125	423	2	0.47%	70.45%	29.55%	100.00%
NO.OF MRI	265	15	280	2	0.71%	94.64%	5.36%	100.00%



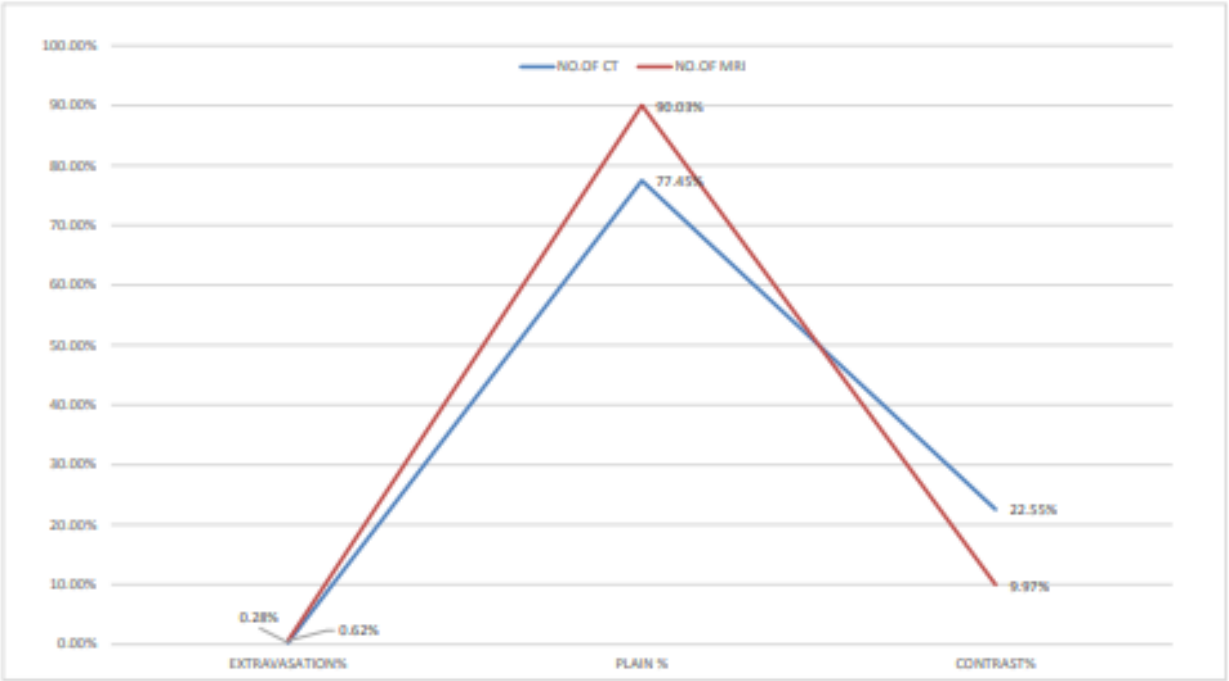
MONTH:- OCTOBER 202	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	302	130	432	3	0.69%	69.91%	30.09%	100.00%
NO.OF MRI	272	21	293	3	1.02%	92.83%	7.17%	100.00%



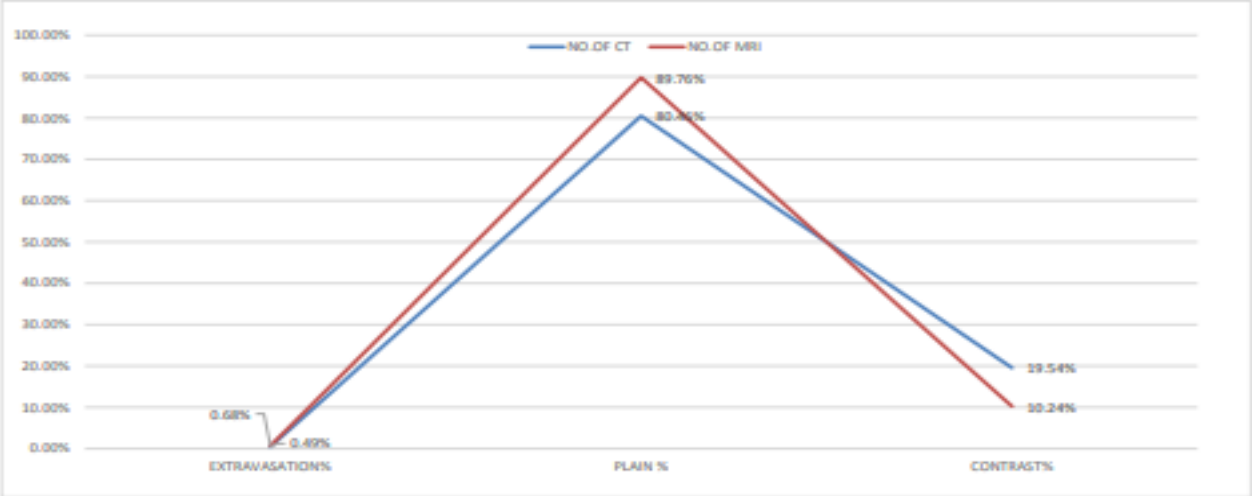
MONTH:- NOVEMBER 202	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	463	135	598	0	0.00%	77.42%	22.58%	100.00%
NO.OF MRI	295	17	312	0	0.00%	94.55%	5.45%	100.00%



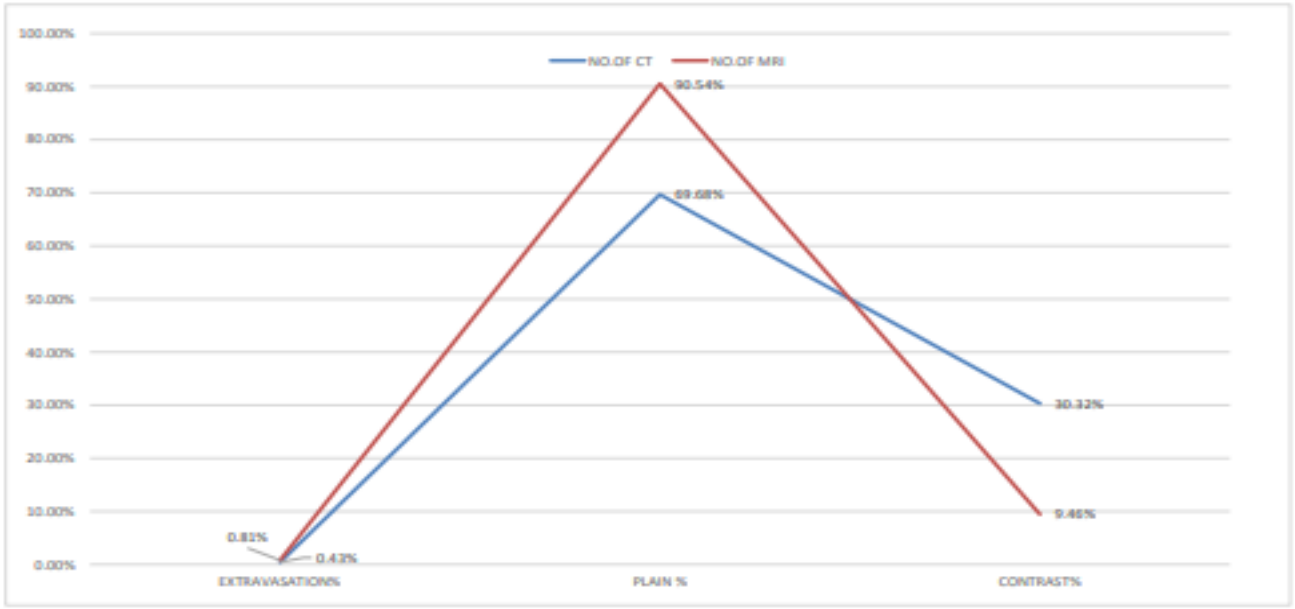
MONTH:- DECEMBER 202	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	553	161	714	2	0.28%	77.45%	22.55%	100.00%
NO.OF MRI	289	32	321	2	0.62%	90.03%	9.97%	100.00%



MONTH:- JANUARY 2023	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	494	120	614	3	0.49%	80.46%	19.54%	100.00%
NO.OF MRI	263	30	293	2	0.68%	89.76%	10.24%	100.00%



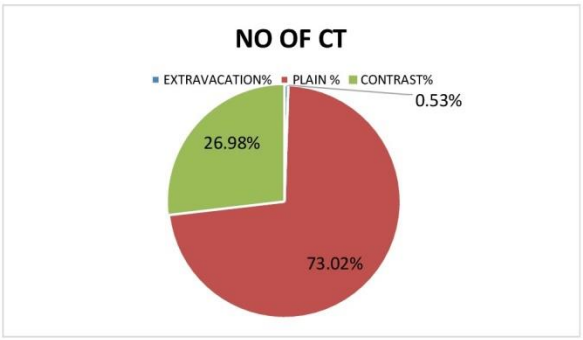
MONTH:- FEBUARY 2023	PLAIN	CONTRAST	TOTAL	EXTRAVASATION	EXTRAVASATION %	PLAIN %	CONTRAST%	Total %
NO.OF CT	324	141	465	2	0.43%	69.68%	30.32%	100.00%
NO.OF MRI	335	35	370	3	0.81%	90.54%	9.46%	100.00%

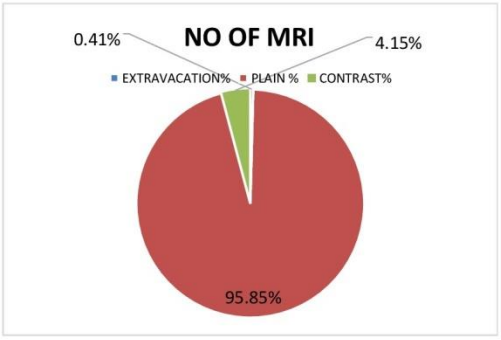


Monthy report analysis of CT/MRI contrast base extravasation percentage

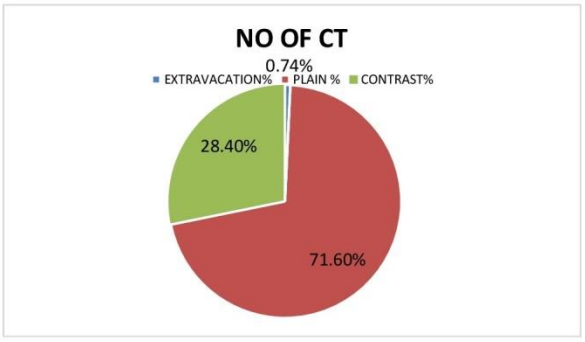
RADIOLOGY DEPARTMENT

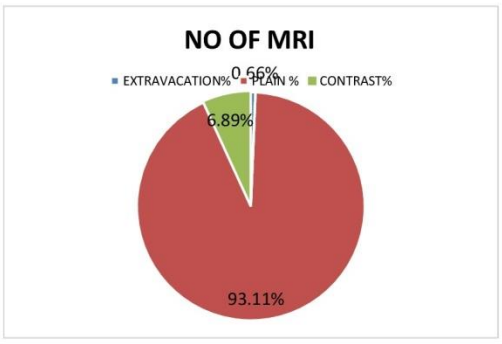
MONTH:- MAY 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	276	102	378	2	0.53%	73.02%	26.98%	100.00%
NO.OF MRI	231	10	241	1	0.41%	95.85%	4.15%	100.00%



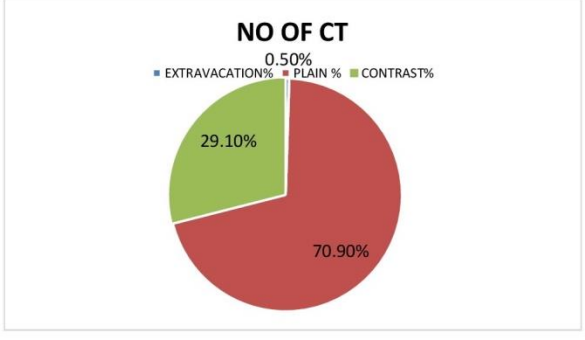


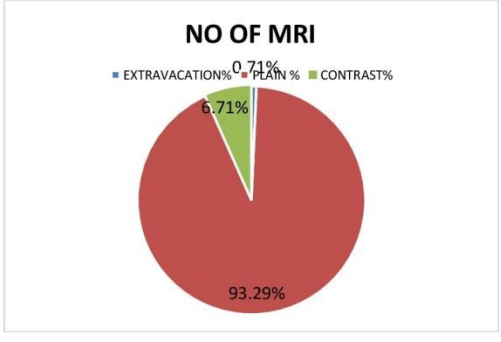
MONTH:- June 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	290	115	405	3	0.74%	71.60%	28.40%	100.00%
NO.OF MRI	284	21	305	2	0.66%	93.11%	6.89%	100.00%



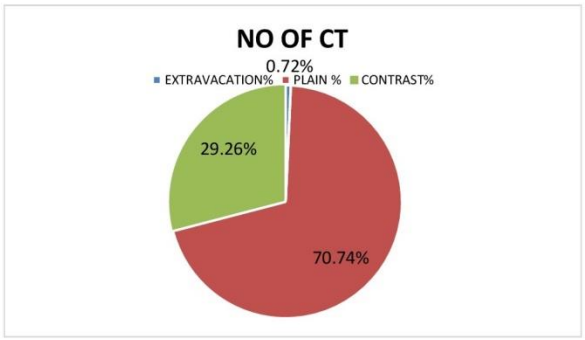


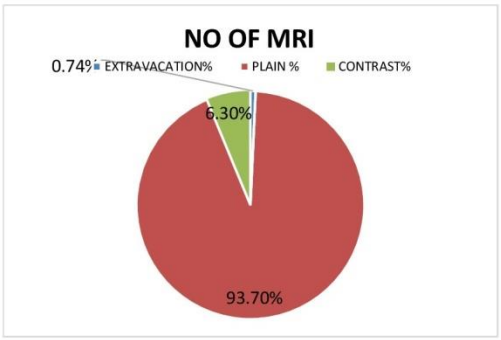
MONTH:- July 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	285	117	402	2	0.50%	70.90%	29.10%	100.00%
NO.OF MRI	264	19	283	2	0.71%	93.29%	6.71%	100.00%



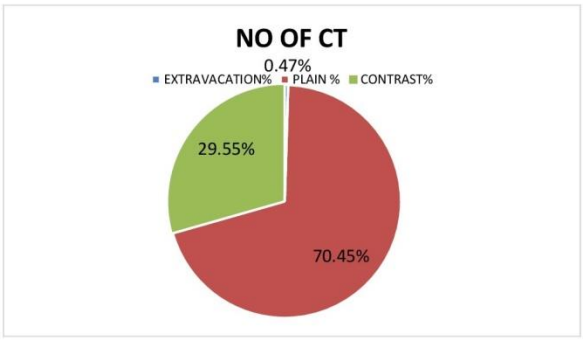


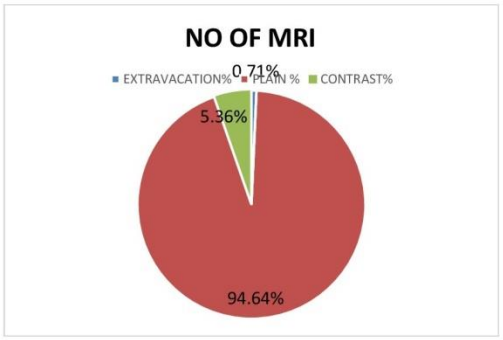
MONTH:- AUGUST 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	295	122	417	3	0.72%	70.74%	29.26%	100.00%
NO.OF MRI	253	17	270	2	0.74%	93.70%	6.30%	100.00%



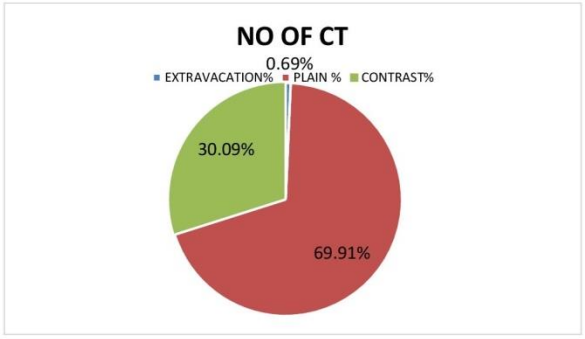


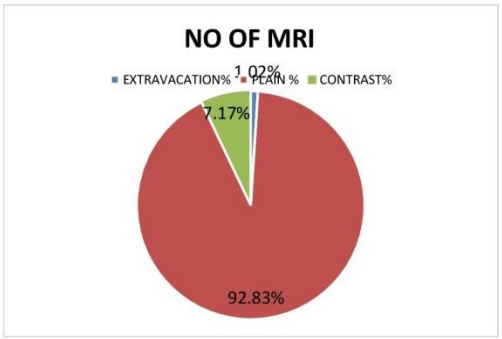
MONTH:- SEPTEMBER 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	298	125	423	2	0.47%	70.45%	29.55%	100.00%
NO.OF MRI	265	15	280	2	0.71%	94.64%	5.36%	100.00%



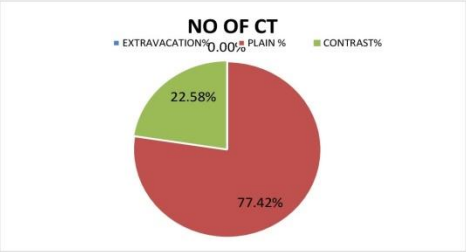


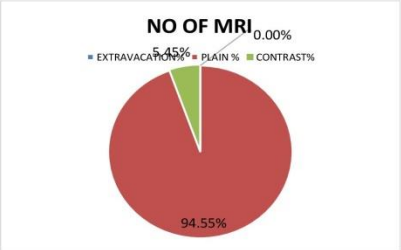
MONTH:- OCTOBER 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	302	130	432	3	0.69%	69.91%	30.09%	100.00%
NO.OF MRI	272	21	293	3	1.02%	92.83%	7.17%	100.00%



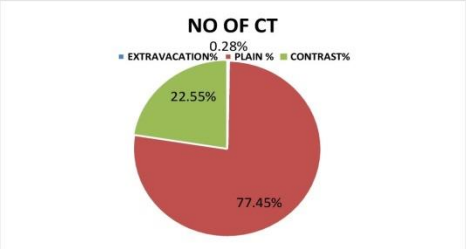


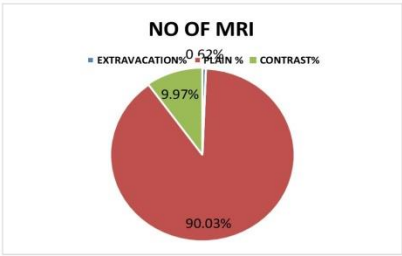
MONTH:- NOVEMBER 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	463	135	598	0	0.00%	77.42%	22.58%	100.00%
NO.OF MRI	295	17	312	0	0.00%	94.55%	5.45%	100.00%



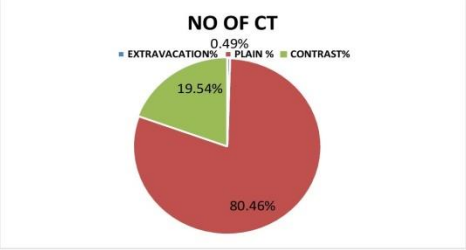


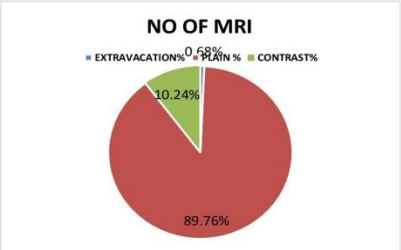
MONTH:- DECEMBER 2022	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	553	161	714	2	0.28%	77.45%	22.55%	100.00%
NO.OF MRI	289	32	321	2	0.62%	90.03%	9.97%	100.00%



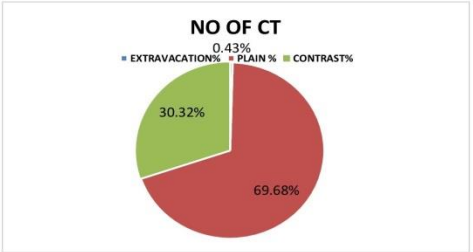


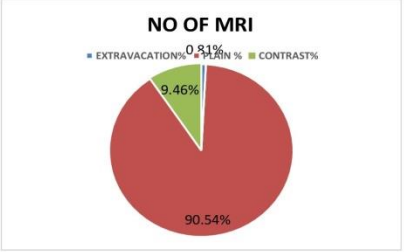
MONTH:- JANUARY 2023	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	494	120	614	3	0.49%	80.46%	19.54%	100.00%
NO.OF MRI	263	30	293	2	0.68%	89.76%	10.24%	100.00%





MONTH:- FEBUARY 2023	PLAIN	CONTRAST	TOTAL	EXTRAVACATION	EXTRAVACATION%	PLAIN %	CONTRAST%	Total %
NO.OF CT	324	141	465	2	0.43%	69.68%	30.32%	100.00%
NO.OF MRI	335	35	370	3	0.81%	90.54%	9.46%	100.00%





Sign of Chair Person Clinical Audit

Medical Superintendent