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Comparison of MRI as imaging of carcinoma cervix

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Abstract
The study was planned to compare the CT & MRI findings in the cervical carcinoma. It will be helpful for the detection of earliest lesion, parametrial assessment, early vaginal and uterine invasion, urinary bladder and rectal invasion and post radiotherapy changes like fibrosis and recurrence.
From the above data generated it is concluded that MR imaging is superior to CT in the evaluation of parametrial status. Generally, the precision rates of CT and MR imaging for pelvic lymph node metastasis were identical in present study.
There are total 9 cases of Uterine extension all are detected by MRI and only 8 were confirmed by CT. In total 9 cases of Bladder extensions all were positive with MRI and 1 is missed in CT. In each 6 cases of Renal extension and parametrical extension all were positive with MRI and 5 are positive with CT. All 4 cases of Vaginal extensions were positive with MRI and 3 are positive with CT. The all 3 cases of Lymph node extension were confirmed by both MRI & CT. The 1 case of Metastasis is confirmed by both CT & MRI.

Keywords: MRI, CT, cervical carcinoma etc.

Introduction
Cervical cancer is a cancer arising from the cervix [1]. It is due to the abnormal growth of cells that have the ability to invade or spread to other parts of the body [11]. Early on, typically no symptoms are seen [1]. Later symptoms may include abnormal vaginal bleeding, pelvic pain, or pain during sexual intercourse [1]. While bleeding after sex may not be serious, it may also indicate the presence of cervical cancer.
Human papillomavirus (HPV) infection causes more than 90% of cases [4, 5]. most people who have had HPV infections, however, do not develop cervical cancer [2]. Other risk factors include smoking, a weak immune system, birth control pills, starting sex at a young age, and having many sexual partners, but these are less important [1, 3]. Cervical cancer typically develops from precancerous changes over 10 to 20 years [2]. About 90% of cervical cancer cases are squamous cell carcinomas, 10% are adenocarcinoma, and a small number are other types [3]. Diagnosis is typically by cervical screening followed by a biopsy [1]. Medical imaging is then done to determine whether or not the cancer has spread [1].
HPV vaccines protect against between two and seven high-risk strains of this family of viruses and may prevent up to 90% of cervical cancers [7]. As a risk of cancer still exists, guidelines recommend continuing regular Pap smears [7]. Other methods of prevention include: having few or no sexual partners and the use of condoms [6]. Cervical cancer screening using the Pap smear or acetic acid can identify precancerous changes which when treated can prevent the development of cancer. Treatment of cervical cancer may consist of some combination of surgery, chemotherapy, and radiotherapy [1]. Five year survival rates in the United States are 68%. Outcomes, however, depend very much on how early the cancer is detected [3].
Worldwide, cervical cancer is both the fourth-most common cause of cancer and the fourth-most common cause of death from cancer in women [2], In 2012, an estimated 528,000 cases of cervical cancer occurred, with 266,000 deaths [2]. This is about 8% of the total cases and total deaths from cancer. About 70% of cervical cancers occur in developing countries [2]. In low-income countries, it is the most common cause of cancer death.
In India, the number of people with cervical cancer is rising, but overall the age-adjusted rates are decreasing. Usage of condoms in the female population has improved the survival of women with cancers of the cervix.
Hence the study was planned to compare the CT & MRI findings in the cervical carcinoma. It will be helpful for the detection of earliest lesion, parametrial assessment, early vaginal and uterine invasion, urinary bladder and rectal invasion and post radiotherapy changes like fibrosis and recurrence.

Methodology
The study is conducted in North Indian Hospital in Radiology department, From Dec 2016 to July 2017, The approval of ethical committee had been taken along with the consent from the patients were also taken. Total 20 patients having are group of 20-60 year were enrolled in to the study.
CT Images of the pelvis will be obtained on a Toshibha, Asteion TSX -021A Spiral CT unit. Matrix size of 512 * 512 and slice section of 10mm.
MRI was performed on the 1.5 Tesla system (GE Healthcare) using a pelvic array coil for the pelvic scan and a torso phased-array coil for the paraaortic scan.

Results & Discussion
The 20 patients included in the study were having clinicalsuspicion of uterine cervical carcinoma were included in this study. All the enrolled patients were diagnosed with the MR & CT imaging.

Table 1: Age group of the Patients

Age group	Number of cases
20-30	0
31-40	0
41-50	8
51-60	7
61-65	5
Total	20

Table 2: Staging of Carcinoma of Cervix

Age group	Number of cases
Stage IB	8
Stage IIA	1
Stage IIB	1
Stage III	0
Stage IVB	6
Stage IVB	4
Total	20

Table 3: Detection of Uterine Extension

Observation	Total Cases	Detected by MRI	Detected by CT
Uterine Extension	9	9	8
Bladder Extension	9	9	8
Renal Extension	6	6	5
Parametrial Extension	6	6	5
Vaginal Extension	4	4	3
Lymph Node Extension	3	3	3
Metastasis	1	1	1

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In a study done by Vick *et al* [8]. which included sixteen patients of newly diagnosed cases of cervical carcinoma, false positive cases of parametrial involvement was high on CT when the criteria of prominent parametrial strands were used as compared to the irregular lateral cervical margins and parametrial mass.

In the study done by Mitchell DG, Synder B *et al*., [9] in 208 patients biopsy proven invasive cervical carcinoma. They concluded MRI is superior to CT for evaluating uterine body invasion.

In previous studies done by James W Walsh and Dean R Goplerud [10]. Kim SH, *et al*., [11] Togashi K, *et al*., [12]; Bellomi M, *et al* [13]. the accuracy of detection of lymph node involvement by CT and MRI was almost same and probably because the size of the lymph node is taken as the criteria.

Conclusion

From the above data generated it is concluded that MR imaging is superior to CT in the evaluation of parametrial status. Generally, the precision rates of CT and MR imaging for pelvic lymph node metastasis were identical in present study. MR imaging has the capability to distinguish between fibrosis and repetition in post radiotherapy cases. MR imaging has numerousadditionalbenefits over CT, such as high-contrast resolution and multiplanar capability which typically demonstrate well the relationship of the uterus, the vagina, the urinary bladder, and the rectum on sagital images. We conclude that MR imaging should be used as routine for imaging study for preoperative staging of uterine cervical carcinoma.

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