

Study of post radiation changes in Papanicolaou Smear

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Introduction:

Carcinoma of the uterine cervix is the most common form of malignancy in Indian females. It constitutes up to 80% of all neoplasms of the female genital tract. Seventy to ninety percent survival is possible in cases presenting with stage IB and II of the disease that are treated with radiotherapy or surgery or both. Recommended treatment for advanced cases of carcinoma cervix (stage IIB, III and IV) is Radiotherapy alone. Papanicolaou (PAP) smear testing is valuable for the detection of intraepithelial neoplasm and invasive carcinoma cervix. Detection of recurrence of carcinoma cervix is best carried out by PAP smear examination of cases treated with radiotherapy.

Aims and Objectives

1. To study post radiation changes in cervical smears.
2. To detect recurrence of invasive carcinoma cervix after completion of radiotherapy.
3. To study and differentiate between post-radiation dysplasia and recurrence of carcinoma cervix.
4. To confirm cytological findings with the help of histopathology study of the same cases wherever possible.

Observation:

Table I : Distribution of cases (Total Number of cases N = 55)

Age Group	Clinical Stage	Histopathological Diagnosis	Mode of Treatment
20-30 (08)	I-08	Large cell nonkeratinizing SCC - 48	Radiotherapy -42
31-40 (10) 41-50 (25)	II -20 III -22	Keratinizing SCC - 04 Adenocarcinoma - 02	Radiotherapy + Chemotherapy - 02 Post-operative Radiotherapy - 1 0
51-60 (10) 61-70 (02)	IV -05	Glassy Cell Carcinoma - 0 1	Preoperative Radiotherapy- 01

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Materials and Methods:

1. Present study was carried out at Rural Hospital and Cancer Research Centre over a period of 2½ years from January 2000 to July 2002.
2. Previously diagnosed cases of carcinoma cervix on follow-up after completion of radiotherapy were included.
3. A total of 55 post-operative patients were subjected to PAP smear examination. Smears were made by using Ayre's wooden spatula, either from the cervix or from the vagina. Out of 55 patients, 35 had two smears collected at varying intervals and the remaining 20 patients had only one PAP smear examination. The first smear was collected within one year of completion of radiotherapy and the second one between 1 year and 2½ years of completion of radiotherapy. Twenty patients had only one PAP smear examination within one year of radiotherapy.
4. Time of collection of smears ranged from 3 months to 2½ years after completion of radiotherapy.
5. Fifty five out of ninety smears were collected within one year after the completion of radiotherapy and labeled as early radiation smears. 35/90 smears were collected between 1 year and 2½ years after completion of radiotherapy and were labeled late radiation smears. 5/55 early radiation smears and 3/35 late radiation smears were unsatisfactory owing to scant cellularity.

Table II : Distribution of early post-radiation smears according to cytological changes observed (n=50).

Sr. No.	Cytological Changes	No. of Smears	Percentage (%)
1	Cellular enlargement	50	100
2	Cytoplasmic vacuolations	29	58
3	Nuclear Changes (nucleomegaly, karyorrhexis and : karyolysis)	40	80
4	Multinucleation	26	52
5	Endocervical cells with radiation changes	14	28
6	Bizarre benign cells	10	20
7	Dysplastic cells	01	02
8	Malignant cells	05	10
9	Fiber cells	08	16

Table III : Distribution of cases of dysplasia diagnosed on follow-up smears

Sr. No.	Age (Years)	Stage	Complaints	Time of Detection following radiotherapy
1	60	II B	Nil	14 months
2	46	II B	Nil	7 months
3	48	IV A	Nil	1 3 months

Table IV : Distribution of cases of recurrence, diagnosed on follow-up smears (n=06)

Sr. No.	Age (Years)	Clinical Stage P/S,	Per Vaginal Features	Time of Detection
1	29	II B	Very small lesion at vault	8 months
2	55	III B	Cervix flushed with Vagina, fibrosis	13 months
3	35	III B	Induration over posterior fornix	5 months
4	50	IV A	Vagina adhesions, mass felt in region of cervix	3 months
5	48	IV A	Cervix flushed with Vagina, nodule on right, fornix	3 months
6	30	II B	Cervix flushed with vagina, blood stained discharge	8 months

Discussion :

- In the present study slightly less than half of the patients (45.45%) were in fifth decade of life which was less in comparison to studies done by Muram D et al and Gallion H et al. This could be due to illiteracy and low socio-economic status in a rural set-up.
- Most of the patients (40%) were in clinical stage III disease, however Patten SF al^[3] and Muram D et al observed that most of the patients were in clinical stage II disease. This could be due to late reporting of patients in a rural set-up.
- Mode of treatment given to the patients was in accordance with the studies made by McKenzie et al.

4. The early radiation changes in the present study were in accordance with the observations made by Gupta S et al.^[2]
5. Incidence of dysplasia in present study is 5.45%. This is less in comparison to studies by Patten S.F et al^[4], McLennan MT and McLennan C.E et al. This could be due to shorter duration of follow-up available for this study.
6. In the present study, incidence of recurrence is 10.90% which correlates with McLennan M.T, McLennan C.E and Mishra J.S.^[6]

Conclusion:

1. Cytology is highly effective in early detection of post-radiation dysplasia and recurrence of carcinoma.
2. The knowledge of cellular changes resulting from radiation is necessary. These changes are cellular enlargement, cytoplasmic vacuolations, nuclear changes, multinucleation and fiber cells in the background.
3. In post radiation changes, there is proportionate cellular and nuclear enlargement, resulting in normal nuclear cytoplasmic ratio thus distinguishing it from dysplasia or recurrence.

4. The severity of radiation changes were diminished in late radiation smears as compared to early radiation smears.

References:

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