

and once again focuses on the need for a national cervical screening programme to impact on mortality.

REFERENCES

1. Fenton LA, Fisher PM, Macgregor JE, Templeton AA. Screening for cervical cancer. In: Bonnar J, ed. *Recent Advances in Obstetrics and Gynaecology*. No. 16. Edinburgh: Churchill Livingstone, 1990: 127-140.
2. Sitas F. *National Cancer Registry of South Africa: Annual Statistical Report for 1989*. Johannesburg: South African Institute for Medical Research, 1994: 27-28.
3. Gordon Grant MC. Carcinoma of the cervix — a tragic disease in South Africa. *S Afr Med J* 1982; **61**: 819-822.
4. Levin CV, Sitas F, Odes RA. Radiation therapy services in South Africa. *S Afr Med J* 1994; **84**: 349-351.
5. Sironi S, Belloni C, Taccagni GL, DelMaschio A. Carcinoma of the cervix: Value of MR imaging in detecting parametrial involvement. *AJR* 1991; **156**: 753.
6. Smit BJ, Du Toit JP, Groenewald WA. An indwelling intrauterine tube to facilitate intra-cavitary radiotherapy of carcinoma of the cervix. *Br J Radiol* 1989; **2**: 68-69.
7. Kaplan EL, Meier P. Non-parametric estimation from incomplete observations. *J Am Stat Assoc* 1958; **53**: 457-481.
8. Petterson F, ed. Carcinoma of the cervix uteri. In: *Annual Report on the Results of Treatment in Gynaecological Cancer. FIGO 1990*. Stockholm: Radiumhemmet, 1990.
9. Buga GAB, Amoko DHA, Ncayiyana DJ. Sexual behaviour, contraceptive practice and reproductive health among school adolescents in rural Transkei. *S Afr Med J* 1996; **86**: 523-527.
10. Kavadi VS, Eiffel PJ. FIGO stage IIIa carcinoma of the uterine cervix. *Int J Radiat Oncol Biol Phys* 1992; **24**: 211-215.
11. Lanciano RM, Martz K, Coia L, Hanks GE. Tumor and treatment factors improving outcome in stage IIIb cervix cancer. *Int J Radiat Oncol Biol Phys* 1991; **20**: 95-100.
12. Stehman FB, Bundy BN, DiSaia PF, et al. Carcinoma of the cervix treated with radiation therapy. *Cancer* 1991; **67**: 2776.

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Inappropriately resected cervical carcinoma — a preventable condition?

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Objective. Description of demographic data and identification of possible preventable causes in patients with inappropriately resected cervical carcinoma.

Setting. Unit of Gynaecological Oncology, Tygerberg Hospital.

Methods and materials. Retrospective analysis of 45 patients with inappropriately resected cervical carcinoma for the period 1985 - 1994.

Results. Forty-five patients with a mean age of 51.1 years and a mean parity of 5 were included in the study. The majority of patients had early-stage disease (55.5%). Patients managed primarily in non-tertiary facilities had a statistically significant higher incidence of preventable causes ($P = 0.0002$). The majority of the study population had endocervical adenocarcinoma. The most common reason for preventable inappropriately resected disease was the absence of evaluation of abnormal cervical cytology.

Conclusion. Cases of inappropriately resected cervical carcinoma could be reduced if appropriate pre-operative assessment of patients with abnormal cytology is undertaken.

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Carcinoma of the cervix is the commonest gynaecological malignancy in South Africa. FIGO criteria exist to stage the disease according to clinical guidelines.¹ In clinical practice not all patients are staged according to these guidelines. For survival analysis and accurate statistical data, these patients can be divided into two subgroups. The first subgroup consists of those patients who are diagnosed with a certain stage of cervical carcinoma but in whom the appropriate therapy, either surgery or radiotherapy, cannot be implemented for medical or other reasons. The second subgroup consists of those patients diagnosed postoperatively with invasive cervical carcinoma, but in whom the appropriate treatment was not implemented. In the vast majority of cases this means that standard hysterectomy was undertaken instead of more appropriate radical hysterectomy or radiotherapy. Postoperative staging of cervical cancer does not fall into the defined clinical

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criteria designated by FIGO and these cases were assigned to a special category.

This study was undertaken to analyse demographic data on all patients with special-category cervical carcinoma referred to the Unit of Gynaecological Oncology at Tygerberg Hospital for further management after inappropriate surgery had been performed. Analysis included the identification of possible preventable causes in each case.

Methods and materials

A retrospective analytical study was undertaken of all patients with special-category cervical carcinoma (inappropriately resected) managed at Tygerberg Hospital during the period 1985 - 1994. Clinical and radiotherapeutic records of 45 patients were studied.

The study group consisted of patients managed primarily at Tygerberg Hospital; referrals were included. The patients were diagnosed with special-category cervical carcinoma as defined by FIGO when it was evident from the available data that inappropriate standard hysterectomy had been performed for a disease more advanced than micro-invasion (> 3 mm).^{1,2}

Subsequent to inappropriate surgery, patients referred to the Unit of Gynaecological Oncology underwent the appropriate special investigations for staging purposes.

All histopathological slides were re-evaluated. In patients managed primarily in rural areas histopathological slides were obtained for assessment. In every case relevant information on the pre-operative evaluation and intra-operative findings were obtained.

All patients identified as having had inappropriate surgery were retrospectively 'staged' according to FIGO guidelines (1985). In this way the presumed stage at the time of surgery was determined. After studying the available data, it was also determined whether the inappropriate surgery could have been prevented.

Cases were deemed preventable if it was evident from available data that pre-operative clinical assessment had ignored obvious findings, e.g. gross systemic lymphadenopathy. Lack of cervical cytological screening prior to surgery was also categorised as preventable. Availability of cytological screening services was taken into account in assessment. Pre-operative omission of appropriate evaluation of abnormal cervical cytology was regarded as a preventable cause. In assessment of intra-operative findings, as reflected by operative reports, failure to respond to abnormal findings, e.g. pelvic and/or para-aortic lymphadenopathy, was regarded as a preventable cause.

All the available data were used to compile a computerised database. Statistical significance ($P > 0.05$) was calculated utilising Fisher's exact test. The odds ratio and 95% confidence interval were calculated with the approximation of Woolf.

Results

Forty-five patients were included in the study. The study group had a mean age of 51.1 years (range 33 - 80) and

mean parity was 5 (range 1 - 18). The cervical cytology findings and eventual histopathological diagnoses are shown in Table I. The distribution of the different presumed pre-operative stages is shown in Table II.

Table I. Special investigation results

	Pre-operative cytology	Postoperative histology
Squamous carcinoma	9 (20%)	19 (42.2%)
Adenocarcinoma	1 (2.2%)	15 (33.3%)
CIN	9 (20%)	
Clear cell carcinoma		3 (6.7%)
Incomplete/other	17 (37.8%)	6 (13.3%)
No cytology/unknown	9 (20%)	2 (4.5%)

Table II. Distribution of presumed retrospective staging

Stage Ia2	2	(4.4%)
Stage Ib	23	(51.1%)
Stage IIb	6	(13.4%)
Stage IIIb	7	(15.6%)
Stage IVa	3	(6.7%)
Stage IVb	2	(4.4%)
Unknown	2	(4.4%)

At the time of analysis 12 patients (26.7%) had died of their disease. The mean survival time was 16.7 months (range 1 - 51 months). Table III reflects comparative data between referred patients and cases managed at tertiary care level. Histopathological diagnosis and the relationship to preventability are set out in Table IV. Because of incomplete information, preventability could not be assessed in 1 case. Reasons for inappropriate management are given in Table V. In the analysis of 1 case a standard hysterectomy was done although the referring notes stated that a radical hysterectomy and pelvic node dissection were performed.

Table III. Management centre and preventability

	Referred cases* (N = 24)	Patients managed primarily at academic institution (N = 21)
Preventable	22	9
Not preventable	1	12 (P < 0.05)

* In 1 case the possibility of prevention could not be determined. OR = 29.33; 95% CI (3.31 - 260.26).

Table IV. Histological diagnosis and preventability

	Squamous carcinoma (N = 19)	Adenocarcinoma* (N = 15)
Preventable	14	10
Not preventable	5	4 (P = 1.0)

* In 1 case, preventability could not be assessed. OR = 1.120; 95% CI (0.24 - 5.25).

Table V. Cases of inappropriate management

Preventable (N = 31)	
Abnormal cytology not evaluated	16
No cytology	7
Clinical or histological diagnosis ignored	7
Standard hysterectomy done	1
Not preventable (N = 13)	
Abnormal cytology appropriately evaluated	9
Normal cytology	4

Discussion

The efficacy of cervical cytology screening to identify pre-malignant and malignant disease is well documented. Given the inordinate magnitude of cervical carcinoma among South African women, cervical cytology prior to elective hysterectomy, irrespective of indication, should be regarded as the standard of care. This standard is moderated by the availability of cervical cytology services. Cervical cytology has a reported false-negative rate of 10 - 15%.^{3,4} In the current study an 8.8% false-negative rate of cytology could be documented. Normal cytology in the presence of invasive cervical cancer contributed to 30.8% of preventable cases. This figure concurs with a 21% rate of normal cytology, with subsequent invasive carcinoma at surgery as reported.⁵

Pre-operative assessment should encompass a meticulous clinical examination to exclude pathology despite the availability of cervical cytology. The presence of 55.5% of advanced stage disease in the current series reflects on the quality of pre-operative clinical assessment. The literature reflects prevalences of 8.7% and 48.6% for advanced stage disease in series by Hoskins *et al.*⁵ and Heller *et al.*,⁶ respectively. Sound clinical judgement should prevail intra-operatively and gross pelvic and/or para-aortic lymphadenopathy or severe induration of the parametria should alert the presiding gynaecological surgeon to the possibility of underlying malignancy.

The postoperative clinical assessment of a case of inappropriately resected cervical carcinoma is fraught with pitfalls due to adhesions and/or induration. In an attempt to stage patients retrospectively, attention to pre-operative signs, as reflected in the clinical records, should be used. In addition, postoperative clinical signs and histopathological assessment of the resection specimen would contribute further to retrospective staging. The presence of pre-operative bilateral hydronephrosis and hydro-ureters and positive margins of the resection specimen would point to the presence of at least stage IIIb disease.

The high percentage of adenocarcinomas (42.2%) in the current series illustrates the difficulty associated with pre-operative diagnosis of an endocervical adenocarcinoma. Corresponding figures in the literature are 30.4% and 14.3%.^{5,6} The current study did not reveal a statistically significant difference in the occurrence of preventable cases when squamous carcinomas were compared with adenocarcinomas ($P = 1.0$) (Table IV).

Assessment of preventability of inappropriate surgery should lead to identification of factors amenable to change. The majority (68.8%) of cases were deemed preventable. Particularly alarming is a 51% incidence of available

abnormal pre-operative cytology in the preventable group (Table V). This aspect reflects gravely on clinical care. In a study by Hoskins a 40% incidence of abnormal cytology was reported in patients undergoing inappropriate surgery.⁵ Inadequacies in clinical assessment and interpretation of available histopathological results contributed to 7 cases of preventable inappropriate surgery. A statistically highly significant difference could be demonstrated in preventability in comparing patients referred from primary and secondary health facilities with those managed in the tertiary training hospital ($P < 0.00002$) (Table III). This could reflect the absence of available expertise in the referral areas, which are predominantly rural.

Conclusions

Inappropriate surgical resection of invasive cervical carcinoma is not an entirely preventable condition. However, diligent, adequate pre-operative clinical assessment and appropriate evaluation of abnormal cervical cytology should curb this phenomenon. Endocervical adenocarcinoma poses a particularly difficult problem with regard to pre-operative assessment and therefore contributes to the majority of cases of inappropriately resected disease. Meticulous attention to a detailed, thorough pre-operative clinical assessment and to cervical cytology should limit inappropriate surgical resection to stage I disease.

REFERENCES

1. Pettersen F. *Annual Report on the Results of Treatment in Gynecological Cancer*. Vol. 22. Stockholm: Panoramic Press, 1994: 30-33.
2. Delgado G, Bundy BN, Fowler WC, *et al.* A prospective surgical pathological study of stage I squamous carcinoma of the cervix. A Gynecologic Oncology Group Study. *Gynecol Oncol* 1989; **35**: 314-318.
3. Beilby JOW, Bornie DMR, Guillebaud J, Steele ST. Paired cervical smears: A method of reducing the false-negatives in population screening. *Obstet Gynecol* 1982; **60**: 46-48.
4. Husain DAN, Butler B, Evans DMD, Macgregor JE, Yule R. Quality control in cervical cytology. *J Clin Pathol* 1974; **27**: 935-944.
5. Hoskins MP, Peters WA, Anderson W, Morley GW. Invasive cervical cancer treated initially by standard hysterectomy. *Gynecol Oncol* 1990; **36**: 7-12.
6. Heller PB, Barnhill DR, Mayer AR, Fontaine TP, Hoskins WJ, Park RC. Cervical carcinoma found incidentally in a uterus removed for benign indications. *Obstet Gynecol* 1986; **67**: 187-190.

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