

of the absolute FIGO staging.

Only lymph node involvement and positive surgical margins were found to correlate with the presence of distant metastases. These factors, especially lymph node involvement, have been consistently mentioned by other authors as poor prognosticators.<sup>13,21,22</sup> In this study, 262 tumors involved pelvic nodes and/or surgical margins. Of the 81.7% (214/262) of these patients who received adjuvant radiotherapy, 35% (78/214) developed recurrence. The failure of radiotherapy to prevent recurrence in this group of patients was probably due to the increased rate of distant metastases expected in these patients. Adjuvant systemic treatment, e.g., chemotherapy, may be considered for patients who show positive lymph nodes and surgical margins although this attempt has not proven to be successful.<sup>23,24</sup>

Among stage IIA cases, menstrual status made no difference in the treatment failure rates. The rates were the same whether or not the cancer presented itself on a postmenopausal retracted cervix that allowed the cervical tumor to grow easily to involve the vagina or on a premenopausal one that usually extended to the vagina only when the tumor was rather bulky. Thus, the involvement of the vagina itself, and not necessarily associated with larger tumors, may have some biological characteristics that lead to a worse outcome with surgical treatment. The explanation may include a different route of lymphatic spread or possible inadequate resection, even the tumor not being noticed on pathological examination, leading to recurrence. This point may be meaningful to gynecologic oncologists who usually treat their stage IIA cervical cancer patients with radical hysterectomy. Finan et al. also corroborated this finding of the insignificant effect of menstrual status on treatment failure rates in their study.<sup>19</sup>

In conclusion, our study shows that of the 985 cases of cervical cancer treated with radical hysterectomy, the risk factors related to treatment failure are tumor size, depth of invasion, parametrial extension, lymph node involvement, and positive surgical margins, with the latter 2 correlating significantly with the presence of distant metastases. The setting of 4 cm as the tumor diameter to further classify stage IB may need further evaluation for there was a continuous increase in failure rates as a function of increasing tumor size, such that no size cut-off sharply separated women at low and high risk of tumor recurrence. The treatment failure rate

was 14.9% for stage IB and 24.9% for stage IIA. Among the stage IIA cases, there was no difference in treatment failure between pre- or postmenopausal patients. The involvement of the vagina itself, even from a small tumor on a retracted cervix, and not necessarily associated with bulky lesions, is a risk factor.

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## REFERENCES

1. Morrow, C.P. Panel report: Is Pelvic Radiation Beneficial in the Postoperative Management of Stage I Squamous Cell Carcinoma of the Cervix with Pelvic Node Metastases Treated by Radical Hysterectomy and Pelvic Lymphadenectomy? *Gynecol. Oncol.* (1980) **10**, 105-110.
2. Fuller, A.F. Jr., Elliott, N., Kosloff, C., Lewis, J.L. Lymph Node Metastases from Carcinoma of the Cervix, Stage IB and IIA: Implications for Prognosis and Treatment. *Gynecol. Oncol.* (1982) **13**, 165-174.
3. Soisson, A., Soper J., Clarke-Pearson, D., Berchuk, A., Montana, G., Creasman, W. Adjuvant Radiotherapy Following Radical Hysterectomy for Patients with Stage Ib and IIA Cervical Cancer. *Gynecol. Oncol.* (1990) **37**, 390-395.
4. Hogan, W.M., Littman, P., Griner, L., Miller, C.L., Mikuta, J.J. Result of Radiotherapy Given after Radical Hysterectomy. *Cancer* (1982) **49**, 1278-1285.
5. Kinney, W.K., Alvarez, R.D., Reid, G.C., Schray, M.F., Soong, S.J., Morley, G.W., Podratz, K.C., Shingleton, H.M. Value of Whole-pelvis Irradiation after Wertheim Hysterectomy for Early-stage Squamous Carcinoma of the Cervix with Pelvic Node Metastasis: A Matched-control Study. *Gynecol. Oncol.* (1989) **34**, 258-262.
6. Edinger, D., Watring, W., Anderson, B., Mitchell, G. Residual Tumor Following Radiotherapy for Locally Advanced Carcinoma of the Uterine Cervix: Prognostic Significance. *Eur. J. Gynecol. Oncol.* (1984) **5**, 90-94.