

Incidence of Cervical Cancer Following Semilunar Biopsy-Repair: A Statistical Comparison with Other Cancer Studies

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□ *Simultaneous biopsy and repair of the uterine cervix is indicated in all patients who have any of the high risk signs or symptoms of malignancy. A simple operative technique, semilunar biopsy-repair, is described.* □

The higher incidence of cervical cancer among women with vaginal bleeding, spotting, or unusual discharge has been documented.¹ Such patients are regarded as a "high risk" group in whom the likelihood of cancer is increased.

We recently described a minor surgical procedure, semilunar biopsy and repair of the uterine cervix (SBR) which provides adequate tissue for biopsy and relieves high risk symptoms by repairing childbirth injuries to the cervix in a manner that restores physiologic function.² We have also compared the operation, performed in over 1200 patients, with reports in the literature on conization of the cervix.³ In our experience, SBR (1) provides equal or more adequate biopsy tissue for histologic diagnosis, (2) involves fewer surgical complications,

(3) heals more rapidly to permit earlier hysterectomy when indicated by a positive biopsy, (4) can be performed repeatedly in women of child-bearing age without adverse effect on fertility, and (5) provides a meaningful degree of cancer prophylaxis.

This paper presents the results of a retrospective study of patients available for followup, in whom SBR has been performed one or more times, to compare the incidence of cervical cancer in our series with that reported in other cancer studies. This also provided an opportunity to review patient records of the number of children born before and after SBR to assess its influence on fertility.

Materials and Methods

Our study encompassed a total of 1110 SBR operations performed on 994 patients available for followup. First performed in 1938, the number of SBR operations performed yearly is shown graphically in Figure 1. The operation was performed once on 905 patients, twice on 71, three times on 12, four times on four, and five times on one and six times on another patient. The ages of the patients at the time of the operations ranged from 14 to 68, the average age being 31.28 years.

Of the 994 women, records of children born before SBR were available for 497 patients who had a total of 1170 children (average, 2.35 per patient at the time of first operation). The average numbers of children born before and after SBR according to the number of times performed per patient are shown in Table 1. The values for average numbers of children born after operation indicate that the procedure does not adversely influence fertility.

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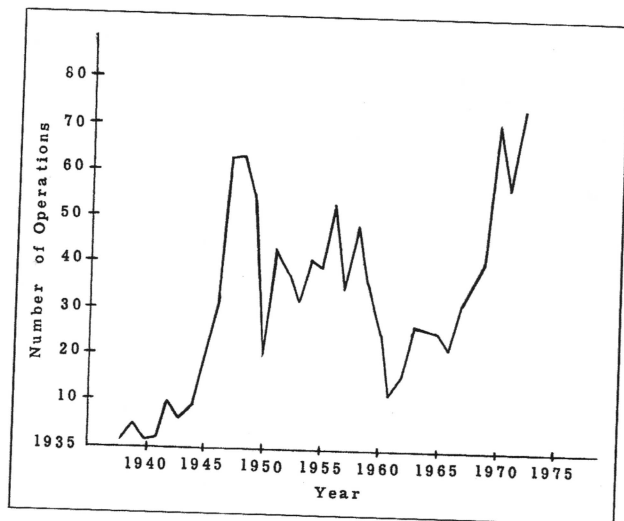


Figure 1

Number of semilunar biopsy-repair operations per year.

The averages of elapsed time between repeated operations are summarized in Table 2. Not shown in the table, the shortest time between two consecutive operations in any one patient was 41 days, as compared to an overall average interval of 4.9 years.

Records of SBR in 444 patients through the year 1971 were used to compute patient-years (from date of first operation to time of the study) for statistical comparison with other cancer studies. This provided a total of 4734.9 patient-years, or an average reporting time of 10.66 years per patient which was considered adequate for the study.

The 444 SBR patients were personally contacted during 1971 and 1972, and Papanicolaou smears or reports of such smears were obtained. Followup examinations were made when indicated. Among these patients there were found to be only two with carcinoma of the cervix, one with cancer *in situ*, and one with invasive cancer. All patients included in the study had undergone SBR one or more times for correction of high risk symptoms. Three previously reported studies of the incidence of cervical cancer were selected for statistical comparisons with that found in SBR patients.^{1,4,5}

Results

The rates of cervical cancer as reported in two studies by Dunn et al. were combined for initial statistical comparison with SBR patients.^{4,5} The results are summarized for *in situ* and invasive cancer in Table 3. In SBR patients the rate for cancer *in situ* is lower, while that for in-

TABLE 1

AVERAGE NUMBER OF CHILDREN BORN AS DETERMINED BY FOLLOWUP OF PATIENTS BEFORE AND AFTER SBR ACCORDING TO NUMBER OF TIMES PERFORMED

No. times SBR performed	1	2	3	4	5	6
Ave. no. children born before SBR	2.35	2.72	3.13	3.67	4.50	7.00
Ave. age of children before SBR	7.97	7.03	10.82	8.62	7.56	17.57
Ave. no. of children born after SBR	0.45	0.50	0.75	0.83	1.50	0.00
Total no. children born to followup patients	1170	185	50	22	9	7

TABLE 2

AVERAGE ELAPSED TIME BETWEEN SBR AS REPEATED IN SOME PATIENTS

SBR sequence	1 - 2	2 - 3	3 - 4	4 - 5	5 - 6
No. patients	89 (994-905)	18 (89-71)	6 (18-12)	2 (6-4)	1 (2-1)
Longest interval (yr.)	18.8	10.4	4.9	5.0	-
Shortest interval (yr.)	0.11	0.25	2.0	9.7	-
Ave. interval (yr.)	5.2	4.0	4.5	3.0	10.6

TABLE 3
COMPARISON OF CERVICAL CANCER RATES (DUNN) WITH SBR PATIENTS PER 1000 PERSONS

<i>In Situ Cancer</i>					
Age Group	Dunn Rate*	Patients	Expected No. of Cases	SBR Patients	SBR Rate
-19	1.269	7	0.009	0	--
20-29	3.285	82	0.270	0	--
30-39	6.384	78	0.498	1	12.82
40-49	4.119	141	0.581	0	--
50-59	4.567	91	0.416	0	--
60-69	4.886	37	0.181	0	--
70-	6.723	8	0.054	0	--
Total	4.462	444	1.981	1	2.25
<i>Invasive Cancer</i>					
Age Group	Dunn Rate*	Patients	Expected No. of Cases	SBR Patients	SBR Rate
-19	--	7	--	0	--
20-29	0.185	82	0.015	0	--
30-39	1.034	78	0.081	0	--
40-49	1.093	141	0.154	1	7.092
50-59	2.072	91	0.189	0	--
60-69	3.284	37	0.122	0	--
70-	3.194	8	0.026	0	--
Total	1.552	444	0.6689	1	2.25

* Rates derived by combining results from Dunn and Martin⁴ (Table 2) and Dunn et al.⁵ (Table 2).

vative cancer is higher, than the corresponding rates derived by combining the results reported by these investigators. However, these differences are not statistically significant (z equals -1.04, *in situ*; z equals 0.56, invasive).

Another comparison of SBR patients with the rates reported for a low risk group by Dunn and Martin,⁴ based upon person-years instead of per thousand persons, is shown in Table 4. Again, the rates for SBR patients are lower for *in situ* and higher for invasive cancer, and neither of these differences is statistically significant (z equals -0.45, *in situ*; z equals 0.47, invasive).

Finally, a comparison was made between the incidence of cervical cancer (*in situ* and invasive) as reported in a more recent study by Hammond et al. and that

found in SBR patients.¹ The cancer rates in SBR patients (all at high risk before operation) were significantly lower (at the 0.01 level) than for Hammond's high risk patients (z equals -2.56, *in situ*; z equals -2.73, invasive). The SBR rates also were lower than for Hammond's low risk group, but the differences were not statistically significant at the 0.05 level (z equals -1.52, *in situ*; z equals -1.41, invasive). These results are consistent with our view that the SBR operation can convert high risk patients to a low risk category.

Discussion

Hammond's group estimates that four percent of the female population at large are in the high risk category of cervical cancer (i.e., have experienced vaginal bleeding,

TABLE 4
COMPARISON OF CERVICAL CANCER RATES (DUNN) WITH SBR PATIENTS PER 1000 PERSON-YEARS

<i>In Situ Cancer</i>					
Age Group	Dunn Rate*	Persons	Expected No. of Cases	SBR Patients	SBR Rate
-19	--	29.10	--	-	--
20-29	1.034	679.56	0.703	0	--
30-39	0.491	1528.09	0.751	1	0.654
40-49	0.435	1571.48	0.684	0	--
50-59	0.444	693.52	0.308	0	--
60-69	1.071	177.39	0.190	0	--
70-	--	32.00	--	0	--
Total	0.59	4716.13	2.78	1	0.212

<i>Invasive Cancer</i>					
Age Group	Dunn Rate*	Persons	Expected No. of Cases	SBR Patients	SBR Rate
-19	--	29.10	--	0	--
20-29	--	679.56	--	0	--
30-39	0.061	1528.09	0.094	0	--
40-49	0.145	1571.48	0.228	1	0.636
50-59	0.148	693.52	0.103	0	--
60-69	--	177.39	--	0	--
70-	--	32.00	--	0	--
Total	0.08	4716.13	0.377	1	0.212

* Rates derived from Dunn and Martin⁴ (Table 3, low-risk group).

spotting, and unusual discharge), although 21 percent of his patients were in this category.¹ He points out that the incidence of cervical cancer *in situ* in high risk patients is twice that of low risk patients, and for invasive cancer the incidence is 2.2 to 3.3 times higher in high risk as compared to low risk patients.

In the two patients of our series in whom cervical carcinoma developed following SBR, the sequence of events was interesting. *In situ* cancer occurred in a patient who had had three children prior to SBR in 1960 at age 27. Following a fourth child born in 1963 she underwent a second SBR. A fifth child was born in 1965. Two years later, when a third SBR was performed, the biopsy specimen was positive for cancer *in situ* and she underwent hysterectomy. It is our feeling that had

this patient returned for regular followup after her fifth child, correction of the cervical injury by the third SBR before a lapse of two years might have prevented the onset of carcinoma.

Invasive cancer developed in a patient who had had two children, one in 1950 and the second in 1953. She underwent SBR in 1957 at age 32. In 1970 a Papanicolaou smear was Class I negative. In 1972 a second SBR was performed and the biopsy tissue revealed invasive carcinoma, for which appropriate treatment was instituted. Again, we feel that the loss of followup and lapse of time before the second SBR may have contributed to the development of invasive cancer, which was detected by the semilunar biopsy. This also illustrates the adequacy of biopsy tissue provided by the operation.

Summary

Women with vaginal bleeding, spotting, and unusual discharge are at high risk of cervical cancer. In a series of 444 such patients there was a statistically significant lower incidence of *in situ* and invasive carcinoma following semilunar biopsy-repair of the uterine cervix (SBR), as compared to the rates reported in a recent study of patients not treated by this method.

No statistically significant differences in cancer incidence were found between SBR patients and low risk groups reported in other cancer studies. This suggests that SBR converts high risk patients to a low risk category and that early operation is indicated as soon as cancer danger signals appear. Moreover, SBR can be repeated as indicated during the childbearing age without adverse effect on fertility.

It is our conclusion from this study that simultaneous biopsy and repair of the uterine cervix is indicated in all patients who have any of the high risk signs or symptoms of malignancy. In our experience SBR offers a simple operative method of adequate tissue biopsy and a repair of the cervix, capable of converting high risk symptoms to a low risk category. In view of the large number of women in the high risk category, SBR should be a primary consideration for reducing the incidence of cervical cancer. □

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