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BRIEF COMMUNICATON

FIGO-staging of cervical cancer: Can't it be communicated in a better way ?

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Abstract

Aim: To correlate existing format of FIGO-staging of cervical cancer in clinical practice.

Method: Review of clinical practice guidelines and journal publications.

Result of clinical practice guidelines.

Conclusion: A modified form of cervical cancer staging is proposed to make it practical for clinical evaluation, provisional management plan and prognosis based on tumor size and parametrial invasion.

Key words: Modification, parametrial invasion, survival, tumor size.

Introduction:

All recommended treatment modalities for carcinoma cervix, so far depend on tumor size and status of parametrial spread for primary treatment plan, and surgical margin and lymph node status for further management. Globally accepted staging for cervical cancer is FIGO clinical staging.[1] It has helped the medical community to compare and communicate data in a uniform format. But it is not devoid of inconvenience during clinical practice at times. It has its intrinsic drawbacks like inaccuracies and mis-staging when compared to surgical staging. Inaccuracies[2] between clinical staging and surgical staging were found 22.9% in stage 2b and 64.4 % in stage 3b. Another gray area of labeling a particular stage is at the surgeons' aggressiveness towards radical surgery especially at around FIGO stage 1b2. It is subjective and will be guided by learning curve on radical surgery. Staging is a method of communicating clinical stage of cancer and a means of evaluating the management plans used. But it should not prevent us trying to communicate the disease status and evaluate the treatment on better way. One option would be to modify existing staging system to a simpler and a better form based on prognostic factors like tumor size and invasion.

Result

Table 1. Linear projection relating tumor size and volume

Tumor size (in cm)	Tumor volume (in cm^3)
1	0.5
2	4.2
3	14.1
4	33.5
5	65.5
6	113.1

NB: Volume= ð/6 × width × length × height, or Volume = ð/6 x $Diameter^3$ using three diameters of the tissue sample. For regular tumor obtained from LEEP. For irregular shaped tumor continuous planimetric calculation software used in MRI system.

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Table 2. *Modified FIGO staging of Cervical Cancer (proposed):*

Proposed Staging		Description	FIGO Staging
0	(CIS)	Pre-invasive or Carcinoma in situ	0
1	(Early)	Tumor less than 2 cm confined to cervix	
	a	Less than 3 mm invasion	1a1
	b	3- 5 mm invasion	1a2
	c	More than 5 mm invasion, more than 7 mm lateral spread	1b1
2	(Intermediate)	Tumor more than 2 cm without parametrial invasion	
	a	Less than 4 cm without vaginal invasion	1b1
	b	Less than 4 cm with upper vaginal invasion	2a
	c	More than 4 cm with or without upper vaginal invasion	1b2/2a
3	(Late)	Tumor with parametrial invasion	
	a	Medial parametrial invasion	2b
	b	Lower vaginal invasion	3a
	c	Lateral parametrial or ureteric invasion	3b
4	(Advanced)	Extension outside reproductive tract	
	a	Bladder, rectum or extrapelvic invasion	4a
	b	Distant metastasis	4b

Discussion

Significance of tumor size, parametrial invasion and lymph node involvement has been described by various treatment guidelines and publications[3] from practitioners. Some of them have been discussed in brief.

National Comprehensive Cancer Network guideline[4] fully recommends radical hysterectomy and lymph node dissection as an effective treatment for stage 1b1 and 2a < 4cm tumor. Post radical hysterectomy adjuvant therapy as well as adjuvant hysterectomy have to be decided by the size of tumor whether < 4cm or > 4cm. For patients who desire fertility preservation, radical trachelectomy and pelvic lymph node dissection with or without para-aortic lymph node sampling for stage 1a2 and 1b1 < 2cm tumor.

Histopathological evaluation of 556 patients[5] who underwent radical abdominal hysterectomy with pelvic lymphadenectomy for carcinoma of the uterine cervix was done. The rate of parametrial involvement increased significantly with FIGO stage (18% in stage IB, 28.5% in stage IIA and 34% in stage IIB; $p < 0.001$) and pelvic lymph node involvement in 27.8%, 28.6% and 46% of patients, respectively ($p < 0.0004$). The rate of pelvic node involvement amongst patients with stage IB-IIB disease, it was 25% in those without parametrial spread and 70% in patients with parametrial spread ($p < 0.0001$). Survival was better in patient without parametrial invasion. This shows the parametrial invasion as an independent prognostic factor.

LVSI (lymphovascular space invasion)[6] is a frequent occurrence in patients with early stage cervical cancer. It represents an unfavorable prognostic factor. With a small tumor (< 2cm) amongst 89 patients, the overall survival was significantly correlated with the presence of LVSI. Study[7] of clinical records and pathological slides of 93 patients at stage 1a2, 1b and 2a demonstrated that the presence of LVSI in the parametria was an independent predictor of metastasis in pelvic and para-aortic lymphatic chains. Large tumor size (greater than 4cm), parametrial perineural invasion, cervical lymphovascular space invasion, and tumor depth (greater than two thirds) were found to be simultaneous predictors of recurrence as well. So LSVI appears as a beneficial parameter for staging in early stage (< 2cm) tumor provided that the reproducibility of reporting LVSI is acceptably high.

Surgically treated 566 patients[8] in stage 1b were studied. Though the cut off for bulky tumor was not agreed, the tumor size was an independently significant risk factor for the prognosis of clinical stage Ib cervical cancer.
A study[9] of 107 patients in stage 1b and 2a, who underwent type 3 radical hysterectomies, found pelvic lymph nodes as good predictors of parametrial status, especially in node-negative patients, and could be used to decrease the paratrectomy in radical surgery.

For the tumor size < 2cm the nodal metastasis is only 6% which increases up to 36% for tumors > 4cm with

likelihood of using adjuvant chemoradiation. Lymph node involvement in stage 1a2 (3-6%) and 6% in stage 1b1 < 2 cm appear close to each other in terms of tumor spread.[10] There is no recommendation of surgery in stage 1b2 and 2a>4cm in either WHO[11] or UK (Scotland)[10] national guideline. Lymph node metastasis was well correlated with tumor size[12] and the survival was correlated with size and lymph node status in early studies.[10, 11, 13]

In another study lymph node metastasis was found in 35.2% of 1b2 (> 4cm) tumor and up to 60% for the size 6 cm or more. But it was 21.1% for tumor less than 4cm.[10] Even if the clinical stage is early one; there is already tumor spread outside the uterus which can't be clearly detected clinically.

Stage 1b2 and 2a > 4cm behave similarly in terms of survival and resectability. Treatment plan is also recommended by many authorities in the same way. Thus practically stage 1b2 and 2a > 4cm are considered a same stage all over. Likewise tumor size over 2cm is not recommended for trachelectomy. Thus parametrial invasion and tumor size are the two main parameters taken into consideration to plan treatment for cervical cancer by many.

A comparative study[14] on laparoscopy and laparotomy method of radical hysterectomy reported a similar progression-free survival for tumors less than 2cm ($4.2cm^3$), whereas the recurrence was found significantly higher in laparoscopic arm for tumors more than $4.2cm^3$. There is exponential increase in tumor volume[15, 16] by each centimeter increase in tumor size. Tumor volume of 4.2 cm^3 at 2cm tumor size will be 8 times at 4cm ($33.5cm^3$) (Table 1).

Thus for the tumors bigger than 4cm radicality of surgery may not be promising. Patients of cancers $0.42cm^3$ or less usually do not develop pelvic node metastases. Tumors with a volume less than $2cm^3$, have a five-year survival rate of about 90%, in contrast to those with volumes of more than $30cm^3$, with less than 65% survival.[17] As the tumor size increases its volume will not be entirely on the site of origin but at the metastatic site also. Estimating tumor volume by linear measurement is only clinical means not enough for late stage tumor. Other means of measurement such as imaging[16,18], surgery, and histopathology[19] will supplement to estimate the tumor load.[20] Tumor volume can now be measured with great accuracy using magnetic resonance imaging.

On univariate analysis[21] of different prognostic factors amongst 1115 cervical cancer patients with radical hysterectomy, recurrence rate was found in 42% in tumor size > 4cm and 29% in < 4cm; 33% in +ve parametrium and 15% in -ve parametrium; 39% with LVSI and 22% without LVSI; 46% in +ve lymph node and 18% in -ve lymph node. Multivariate analysis of both recurrence and survival time in the patients with squamous cell carcinoma shared a consensus that pelvic lymph node metastasis and deep stromal invasion were significant risk factors.

Conclusion

Staging based on clinically correlated anatomy will communicate better than the anatomical basis only. Tumor size of 2cm and 4cm appear to be the cut-offs for management plan used all over. Other two factors are parametrial invasion and lymph node involvement. Stages of tumor, like 1b1/2a < 4cm, 1b2/2a > 4cm, each having similar treatment plan and prognosis seem to be more convenient to keep in a single stage. Same applies to the cut-off for trachelectomy for stage 1b1 < 2cm. So that stage skip will also be corrected while formulating management guideline and looks sequential as well. Thus modification is felt to make the existing FIGO staging system handier with sequential tumor invasiveness based on clinical evaluation by tumor size and parametrial invasion, provisional management plan and prognosis (Table 2).

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