

1, 2, 3, 4, 5

### Risk Factors of Local Recurrence in Phyllodes Tumor

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**Purpose:** A phyllodes tumor is a rare disease of the breast, which shows various clinicopathological aspects. However, there is some controversy over its clinical behavior, pathologic characteristics, and local recurrence rates. Therefore, the clinicopathological characteristics of phyllodes tumor and the risk factor that influence a local recurrence after surgery were analyzed.

**Methods:** The medical records of 56 patients with a phyllodes tumor who had undergone surgery at the Department of Surgery, Yonsei University, from 1986 to 1998, were analyzed retrospectively. The median follow up period was 57.2 months (12-245 months). The microscopic slides were re-examined and the pathologic criteria analyzed were cellular atypia, stromal cellularity, pleomorphism, necrosis, differentiation, tumor margin, and number of mitoses. The malignancy was reclassified using the histological criteria reported by Pietruszka et al. (benign was 0-4 mitoses/10 high-power fields, borderline 5-9 mitoses, and malignant more than 10 mitoses). The clinical features evaluated included age, preoperative diagnosis, tumor size, surgical methods, and local recurrence.

**Results:** The mean age was 41 years (14-69 years) and the mean tumor size was 4.5 cm (1-12 cm). Only 9 cases (16.1%) were preoperatively diagnosed as having a phyllodes tumor. The most commonly performed surgical procedures were local or wide excision (46 cases, 82.1%), and a mastectomy in 10 cases (17.9%). Out of 56 cases reviewed, 43 (76.8%) were confirmed as being a benign, 7 (12.5%) as being a borderline, and 5 (1.8%) as being a

malignant phyllodes tumor. Cellular atypia was minimal in 40 cases (71.4%) and prominent in 14 cases (25.0%). The stromal cellularity was minimal in 32 cases (57.1%) and prominent in 23 cases (41.1%). Pleomorphism and necrosis were represented in only 1 case (1.8%). The tumor margin was infiltrating in 11 cases (19.6%) and pushing in 43 cases (76.8%). A local recurrence developed in 9 cases (16.1%). There were no dependable histopathological features to predict a local recurrence except for cellular atypia, stromal cellularity, and an infiltrating tumor margin.

**Conclusion:** From the above results, the strong prognostic factors that can be used to predict a local recurrence appear to be cellular atypia, stromal cellularity, and an infiltrating tumor margin. (J Korean Surg Soc 2002;63:378-383)

**Key Words:** Phyllodes tumor, Local recurrence, Prognostic factor

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(Phyllodes tumor) 1838 Johannes Müller  
 가 , (I) cystosarcoma phylloides  
 가 Phyllodes  
 tumor , 0.3 1.0%  
 .(2)  
 ,  
 , (stroma  
 atypia), (mitotic activity)  
 10 33%  
 ,(3-5)  
 ,(I)  
 가가 .(6)

(cellular atypia), (stromal cellularity), (pleomorphism), (necrosis), (minimal) (prominent)

Pietruszka (17) (0 4 ), (5 9 ), (10 ) 3

(4,7-16)

SPSS for windows 11.01

T (independent T test)

1986 1 1 1998 12 31 12

(Cross tabulation, <sup>2</sup> test) , LRFS

71 가 가

56 95% P 0.05

가

57.2 (12 245 ) local

relapse free survival (LRFS)

1) 56 41 (14 69 ) 4.5 cm (1 12 cm) (Table 1).

**Table 1.** General characteristics of patients

	N	No. of patients by histology		
		Benign	Borderline	Malignant
Age	Mean (Min. Max.)	41± 12 (14 69) years old		
	< 20	3 (5.4)	0	0
	20 29	8 (14.3)	0	0
	30 39	11 (19.6)	1	2
	40 49	24 (42.9)	2	2
	50 59	6 (10.7)	1	1
	60	4 (7.1)	3	0
Tumor size	Mean (Min. Max.)	4.5±2.6 (1.0 12.0) cm		
	2.0 cm	11 (19.6)	0	0
	> 2.0, 5.0 cm	25 (44.6)	4	2
	> 5.0 cm	15 (26.8)	3	2
	Unknown	5 (8.9)	0	1
Operation	Excision	26 (46.4)	3	0
	Wide excision	20 (35.7)	3	1
	SM*	7 (12.5)	0	3
	MRM <sup>†</sup>	3 (5.4)	1	1

Numbers in parenthesis are percents, \*SM: simple mastectomy, <sup>†</sup>MRM: modified radical mastectomy.

35±9 42±13 (30.0%)  
 (P=0.133), (13.0%)  
 4.6±1.9 cm (20.0%)  
 4.5±2.8 cm 가 (P=0.942). (16.3%, 14.3%)  
 가 7 (12.5%) (Table 2).  
 9 (16.1%) , 47 40 (71.4%)  
 (83.9%) . 26 (46.4%) , 14 (25.0%) , 2  
 , 20 (35.7%) . 32 (57.1%)  
 , 7 (12.5%) , 23 (41.1%) 1  
 3 (5.4%) . 1 (1.8%)  
 43 (76.8%), 7 (12.5%), 11 (19.6%) (infiltrating mar-  
 5 (8.9%), 1 (1.8%) (Table 1). gin) , 43 (76.8%) (pushing  
 가 9 (16.1%) , margin) , 2 (10.0%)  
 47 가 . (35.7%)  
 가 4 , 가 3 , 2 (P=0.007),  
 . (P= 0.009).  
 가  
 2) LRFS 45.5% , (P <  
 35 (25%) 0.001)(Table 3).  
 가 4.0 cm LRFS , , ,  
 22.7% 4.0 cm (13.8%) , , , ,  
 가 , LRFS 가 , , ,  
 (21.2%) (14.9%) LRFS가 (Fig. 1, 2, 3).

**Table 2.** Local recurrence rate according to clinicopathologic factors

Clinicopathologic factors	Number of patients		P value
	n	Recur (%)	
Age	35	4 (25.0)	0.250
	> 35	5 (12.5)	
Tumor size*	4.0 cm	4 (13.8)	0.407
	> 4.0 cm	5 (22.7)	
Preop tissue confirm	None	7 (14.9)	0.583
	Done	2 (21.2)	
Operation	Excision <sup>†</sup>	6 (13.0)	0.186
	Mastectomy	3 (30.0)	
Histology <sup>‡</sup>	Benign	7 (16.3)	0.965
	Borderline	1 (14.3)	
	Malignant	1 (20.0)	

Numbers in parenthesis are percents, \*except 5 unknown case, <sup>†</sup>except 1 unknown case, <sup>‡</sup>Excision: including local and wide excision.

**Table 3.** Local recurrence rate according to pathologic parameters

Pathologic parameters	Number of patients		P value
	n	Recur (%)	
Cellular atypia	Minimal	4 (10.0)	0.007
	Prominent	5 (35.7)	
Stromal cellularity	Minimal	3 (9.4)	0.009
	Prominent	6 (26.1)	
Pleomorphism	Minimal	9 (17.0)	0.643
	Prominent	0 (0.0)	
Necrosis	Minimal	9 (17.0)	0.643
	Prominent	0 (0.0)	
Resection margin	Pushing margin	4 (9.3)	< 0.001
	Infiltrating margin	5 (45.5)	

Numbers in parenthesis are percents, Except 2 unknown case.

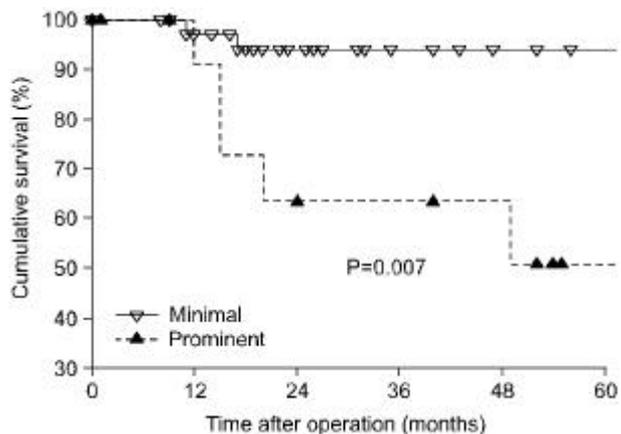


Fig. 1. Loco-regional relapse free survival curve according to cellular atypia.

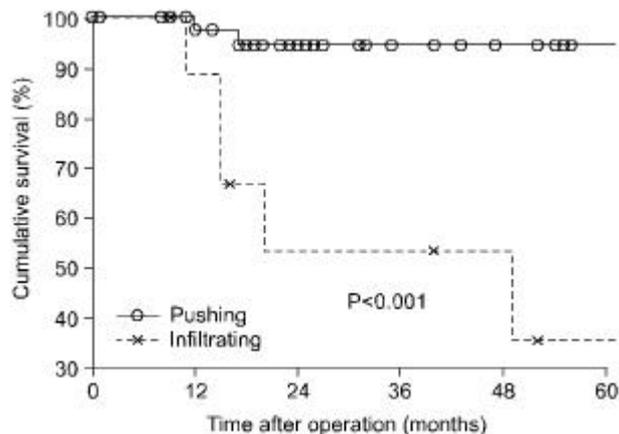


Fig. 3. Loco-regional relapse free survival curve according to tumor margin.

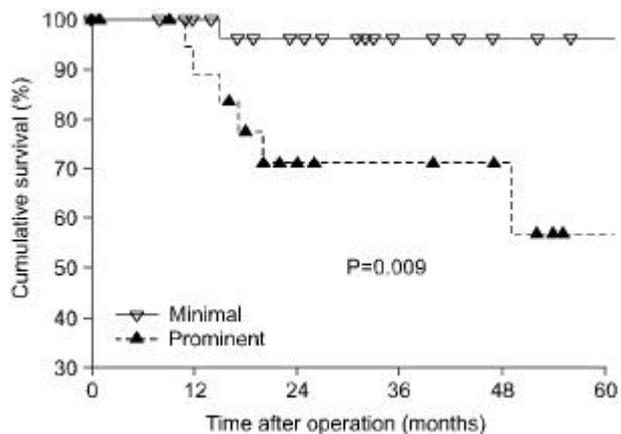


Fig. 2. Loco-regional relapse free survival curve according to stromal cellularity.

(stromal proliferation)  
 가 (23)  
 , 가  
 가 (24)  
 33%  
 (16) 56  
 7 (12.5%)  
 , ,  
 , 가  
 1978 Pietruszka Barnes가 42  
 , 10  
 (10 HPF) (mitosis) 0 4  
 , 5 9 , 10  
 (17)  
 (stroma atypia), (mitotic activity) (5)  
 가 (16) (atypism)가  
 가 가 ,  
 가 가  
 10 33%  
 (18) , 가 ,  
 (3,4) 31.7%,  
 68.3%  
 (16) 21.4% (8.9%)  
 + 12.5%) 76.8% 가  
 .  
 (21)  
 ,  
 (22) , (1)

0.3 1.0%  
 (2) 1838 Johannes Müller가  
 (I) (subepithelial  
 connective tissue) (fibroepithelial cell)  
 2.5%  
 가 ,  
 (18) , 가  
 (11,19,20)  
 가  
 (21)  
 ,  
 (22)

가 가 , (6,25,26)  
 20%, 3 12% .(18)  
 , , (12)가 , 가  
 , (15) ( )  
 )(13)가  
 가 50% , (14)  
 , (11,12) .(15)  
 가 ,(9) ,(4)  
 ,(27)  
 가 ,(28)  
 ,(16)  
 ,(8,9,27-29) 1996 Mallebre (19)  
 , , 2 cm 가  
 , 가  
 , 2 cm 가  
 가  
 56 46 (82.1%) (resection mar-  
 gin)  
 LRFS 가

가 (7,8) 가 7 cm  
 가  
 ,(9)  
 ,  
 가 (10)  
 가  
 ,(11)  
 ,  
 가

**REFERENCES**

1. Müller J. Ueber den feinen Bau und die Formen der Krankhaften geschwulste. Berlin: G. Reimer; 1838. cited by Kim HJ, Kim TS, Kang HJ, Cho JC, Park IA, Noh DY, Youn YK, Oh SK, Choe KJ. Clinical analysis of phyllodes tumor of the breast. J Korean Surg Soc 2000;58(3):352-60.
2. Auger M, Hanna W, Kahn HJ. Cystosarcoma phyllodes of the breast and its mimics. Arch Pathol Lab Med 1989;113:1231-5.
3. Vorherr H, Vorherr UF, Kutvirt DM, Key CR. Cystosarcoma phyllodes: Epidemiology, pathohistology, pathobiology, diagnosis, therapy, and survival. Arch Gynecol 1985;236:173-81.
4. Noh DY, Kim SJ, Choe KJ, Kim JP, Kim WH. Malignant cystosarcoma phyllodes. J Korean Cancer Assoc 1992;24(5): 730-6.
5. Norris HJ, Taylor HB. Relationship of histologic features to behavior of cystosarcoma phyllodes. Cancer 1967;20:2090-9.

6. Lindquist KD, Van Heerden JA, Welland LH, Martin JK. Recurrent and metastatic cystosarcoma phyllodes. *Am J Surg* 1982;144:341-3.
7. Hines JR, Murad TM, Beal JM. Prognostic indicators in cystosarcoma phylloides. *Am J Surg* 1987;153(3):276-80.
8. Rajan PB, Cranor ML, Rosen PP. Cystosarcoma phyllodes in adolescent girls and young women: a study of 45 patients. *Am J Surg Pathol* 1998;22(1):64-9.
9. Browder W, McQuitty JT Jr, McDonald JC. Malignant cystosarcoma phylloides. Treatment and prognosis. *Am J Surg* 1978;136(2):239-41.
10. Cohn-Cedemark G, Rutqvist LE, Rosendahl I, Silfversward C. Prognostic factors in cystosarcoma phyllodes. A clinicopathologic study of 77 patients. *Cancer* 1991;68(9):2017-22.
11. Rowell MD, Perry RR, Hsiu JG, Barranco SC. Phylloides tumors. *Am J Surg* 1993;165(3):376-9.
12. Barth RJ Jr. Histologic features predict local recurrence after breast conserving therapy of phylloides tumors. *Breast Cancer Res Treat* 1999;57(3):291-5.
13. Moffat CJ, Pinder SE, Dixon AR, Elston CW, Blamey RW, Ellis IO. Phylloides tumours of the breast: a clinicopathological review of thirty-two cases. *Histopathology* 1995;27(3):205-18.
14. Hawkins RE, Schofield JB, Fisher C, Wiltshaw E, McKinna JA. The clinical and histologic criteria that predict metastases from cystosarcoma phyllodes. *Cancer* 1992;69(1):141-7.
15. Bennett IC, Khan A, De Freitas R, Chaudary MA, Millis RR. *Aust N Z J Surg* 1992;62(8):628-33.
16. Kim HJ, Kim TS, Kang HJ, Cho JC, Park IA, Noh DY, et al. Clinical analysis of phylloides tumor of the breast. *J Korean Surg Soc* 2000;58(3):352-60.
17. Pietruszka M, Barnes L. Cystosarcoma phyllodes. A clinicopathological analysis of 42 cases. *Cancer* 1978;41:1974-83.
18. Lester J, Stout AP. Cystosarcoma phylloides. *Cancer* 1954;7:335-53.
19. Mallebre B, Ebert A, Perez-Canto A, Hopp H, Opril F, Weitzel H. Cystosarcoma phylloides of the breast. A retrospective analysis of 12 cases. *Geburtshilfe Frauenheilkd* 1996;56(1):35-40.
20. Sheen-Chen SM, Chou FF, Chen WJ. Cystosarcoma phylloides of the breast: a review of clinical, pathological and therapeutic option in 18 cases. *Int Surg* 1991;76(2):101-4.
21. Page JE, Williams JE. The radiological features of phylloides tumour of the breast with clinico-pathological correlation. *Clin Radiol* 1991;44(1):8-12.
22. Zurrida S, Bartoli C, Galimberti V, Squicciarini P, Delledonne V, Veronesi P, et al. Which therapy for unexpected phylloide tumour of the breast? *Eur J Cancer* 1992;28(2-3):654-7.
23. Buchberger W, Strasser K, Heim K, Muller E, Schrocksnadel H. Phylloides tumor: findings on mammography, sonography, and aspiration cytology in 10 cases. *AJR Am J Roentgenol* 1991;157(4):715-9.
24. Pick PW, Jossifides JA. Occurrence of breast carcinoma within a fibroadenoma: a review. *Arch Pathol Lab Med* 1984;108:590-4.
25. Halverson JD, Hori-Rubaina JM. Cystosarcoma phylloides of the breast. *Am Surg* 1974;40(5):295-301.
26. Kessinger A, Foley JF, Lemon HM, Miller DM. Metastatic cystosarcoma phylloides: a case report and review of the literature. *J Surg Oncol* 1972;4(2):131-47.
27. Ward RM, Evans HL. Cystosarcoma phylloides. A clinicopathologic study of 26 cases. *Cancer* 1986 Nov 15;58(10):2282-9.
28. Palmer ML, De Risi DC, Pelikan A, Patel J, Nemoto T, Rosner D, Dao TL. Treatment options and recurrence potential for cystosarcoma phylloides. *Surg Gynecol Obstet* 1990;170(3):193-6.
29. Briggs RM, Walters M, Rosenthal D. Cystosarcoma phylloides in adolescent female patients. *Am J Surg* 1983;146(6):712-4.