Thai Journal of Obstetrics and Gynaecology
June 1999, Vol. 11, pp. 127-137

REVIEW

Uterine Leiomyosarcoma

Sarikapan Wilailak MD,*
Neil B. Rosenshein MD.**

* *Department of Obstetrics and Gynecology, Faculty of Medicine, Ramathibodi Hospital, Mahidol University, Bangkok, Thailand*
** *Division of Gynecologic Oncology, Department of Gynecology and Obstetrics, The Johns Hopkins Hospital, Baltimore, Maryland, U.S.A.*

Incidence

Uterine Leiomysarcoma (LMS) is a rare neoplasm with an estimated yearly incidence between 0.5 and 3.3 per 100,000 women.[1-4] It is considered one of the most lethal of all malignancies of the uterus.[5] Leiomyosarcomas account for approximately 45% of all uterine sarcomas (Table 1)[6-23] and represents 1.3% of all uterine malignancies.[24] The incidence ratio between uterine leiomyomas and leiomyosarcomas is estimated to be 800 : 1.[24] The incidence of sarcomatous change of uterine leiomyoma is reported to be between 0.13% and 0.81%. [25-31]

Etiologic factors

Radiation

An increased incidence of uterine sarcomas following radiation therapy to the pelvis is well documented in the literature[2,7-8,16,18,32-4] but most sarcomas arising after radiation are malignant mixed mullerian tumors.

In uterine LMS, prior pelvic radiotherapy ranges from 1.7-6.7% which is also higher than normal population.[1,14,29,33-37]

Other factors

Hormonal influence has been implicated in the etiology of uterine LMS. Kirkman and algard placed androgen/estrogen pellets in syrian hamsters, found the proliferation of uterine horn smooth muscle cells which progressed from an atypical patern to LMS.[38-39] Furthermore, when leiomyomas of the Guinea pig uterus were included in 125 animals following administration of synestrol, 8 of the animals were observed to have LMS.[40] Further study has to be pursued to identify the causal effect of hormone to LMS.

A uterine LMS was experimentally induced in a rabbit after herpes virus type II inoculations.[41] However, there is no conclusive evidence of causal association between any virus and the development of human soft tissue sarcomas.[42]

Cytogenetic analysis was done on uterine LMS and found clonal chromosome abnormalities, various chromosome changes that included translocations, deletion, insertions were indentified. Laxman et al[43] detected chromosomal abnormalities in 10 to 14 patients of uterine sarcomas (71%), the common abnormal sites were chromosome 1, 7 and 11. So the authors suggested that abnormalities of chromosomes 1, 7 and 11 may play a role in tumor initiation or progression in uterine sarcomas.

uterus. Am J Obstet Gynecol 1966;95:374-9.
86. Dinh TV, Woodruff JD : Leiomyosarcoma of the uterus. Am J Obstet Gynecol 1982;144:817-21.
87. Zaloudek CJ, Norris HJ : Mesenchymal tumors of the uterus. In : Fenoglio C, Wolf M, eds. Progress in surgical pathology, volume III. Masson Publishing 1981:p.1.
88. Norris HJ : Mitosis counting. III. Hum. Pathol. 1976;7:483-8.
89. King ME, Dickerson GR, Scully RE : Myxoid leiomyosarcoma of the uterus : A report of six cases. Am J Surg Pathol 1982;6:589-95.
90. Shroff CP, Deodhar KP, Bhagwat AG : Myxoid leiomyosarcoma of the uterus-A case report with light microscopic and ultrastructural appraisal. Tumori 1984;70:561-7.
91. Chen KTK : Myxoid leiomyosarcoma of the uterus. Int J Gynecol Pathol 1984;3:389-92.
92. Salm R, Evans DJ : Myxoid leiomyosarcoma. Histopathol 1985;9:159-69.
93. Peacock G, Archer S : Myxoid leiomyosarcoma of the uterus : case report and review of the literature. Am J obstet Gynecol 1989;160:1515-8.
94. Chen KTK, Hafez GR, Gilbert EF : Myxoid variant of epithelioid smooth muscle tumor. Am J Clin Pathol 1980;74:350-4.
95. Kunzel KE, Mills NZ, Muderspach LI, D'Ablaing III G : Myxoid leiomyosarcoma of the uterus. Gynecol Oncol 1993;48:277-80.
96. Aida Y, Tadokoro M, Takeuchi E, Shinagawa T, Ishigawa E, Iwata M, et al : Myxoid variant of epithelioid leiomyosarcoma of the uterus. Acta Pathologica Japonica 1991;41:77881.
97. Burns B, Curry RH, Bell MEA : Morphologic Features of prognostic significance in uterine smooth muscle tumor : a review of 84 cases. Am J Obstet Gynecol 1979;135:109-12.
98. Chiara S, Foglia G, Odicino F, Grazinai A, Conte PF, Ragni : Uterine sarcomas : a clinocopathologic study. Oncology 1988;45:428-32.
99. Punnonen R, Lauslahti K, Phystynen P, Kauppila : Uterine sarcomas. Annales Chirurgiae et Gynaecologiae, Suppl 1985;197:11-8.
100. Rendina GM, Donadio C, Fabri M, Orfei G, Rutigliano A, Saccucci P : Clinical and histopathological review of 24 cases of sarcoma of the corpus uteri. Eur J Gynaecol Oncol 1984;2:14-8.
101. Tanga B, Delgado G : Uterine sarcoma. Int Surg 1982;67:339-42.
102. Hart WR, Billman JK : A reassessment of uterine neoplasms originally diagnosed as leiomyosarcomas. Cancer 1978;41:1902-6.
103. Perrone T, Dehner LP : Prognostically favorable " Mitoticaly Active" smooth-muscle tumors of the uterus : a clinicopathologic study of ten cases. Am J Surg Pathol 1988;12:1-8.
104. Lohe KJ, Baltzer J, Wolf W, Kurzl R : Clinical results in the management of patients with uterine sarcoma. Path Res Pract 1980;169:200-7.
105. Young RH, Scully RE : Sarcomas mestastatic to the ovary : a report of 21 cases. Int J Gynecol Pathol 1990;9:231-5.
106. Chuang JT, Van Velden DJ, Graham JB : Carcinosarcoma and mixed mesodermal tumor of the uterine corpus. Review of 49 cases. Obstet Gynecol 1979;35:769-73.
107. Younis JS, Okon E, Anteby SO : Uterine leiomyosarcoma in pregnancy. Arch Gynecol Obstet 1990;247:155-9.
108. Michel G, Pheiffer F, Duvillard P, Prade M, Castaigne D, Zarca D : Sarcoma of the uterus : a clinical study. 50 cases operated on in the Institut Gustave-Roussy a review of the literature. J Gynecol Obstet Biol Reprod 1989;18:1024-8.
109. Belgrad R, Elbadawi N, Rubin P : Uterine sarcoma. Radiology 1975;114:181-7.
110. Webb GA : Uterine sarcoma, Obstet Gynecol 1955; :38-41.
111. Sorbe B : Radiotherapy and/or chemotherapy as adjuvant treatment of uterine sarcomas. Gynecol Oncol 1985;20:281-5.
112. Shimm DS, Bell DA, Fuller AF, Bowing MC, Orlow EL, Munzenrider JE : Sarcomas of the uterine corpus : prognostic factors and treatment. Radiotherapy and Oncology 1984;2:201-7.
113. Salazar OM, Dunne ME : The role of radiation therapy in the management of uterine sarcomas. Int J Radiation Oncology Biol Phys 1980;6:899-93.
114. Azizi F, Bitran J, Javehari G, Herbst AL : Remission of uterine leiomyosarcomas treated with Vincristine, Adriamycin, and dimethyl-triazeno-imidazole carboximide. Am J Obstet Gynecol 1979;133:379-82.
115. Omura GA, Major FJ, Blessing JA, Sedlacek TV. Thigpen JT, Creasman WT : A randomized study of Adriamycin with and without dimethyl triazenoimidazole carboximide in advanced uterine sarcomas. Cancer 1983;52:626-30.
116. Hannigan EV, Freedman RS, Elder KW, Rutledge FN : Treatment of advanced uterine sarcoma with Adriamycin. Genecol Oncol 1983;16:101-5.
117. Muss HB, Bundy B, Disaia PJ, Homesley HD, Fowler WC, Creasman W : Treatment of recurrent or advanced uterine sarcoma : a randomized trial of doxorubicin versus doxorubicin and cyclophosphamide. Cancer 1985;55:1648-52.
118. Thigpen TJ, Blessing JA, Homesley HD, Hacker N, Curry SL : Phase II trial of piperazindione in patients with advanced or recurrent uterine sarcoma : a Gynecologic Oncology Group study. Am J Clin Oncol 1985;8:350-6.
119. Thigpen TJ, Blessing JA, Wilbanks GD : Cisplatin as second-line chemotherapy in the treatment of advanced or recurrent leiomyosarcoma of the uterus : a phase II trial of the Gynecologic Oncology Group. Am J Clin Oncol 1986;9:18-21.
120. Gynecological Group, Clinical Oncological Society of Australia and the Cancer Institute, Melbourne, Australia : Tamoxifen in advanced and recurrent

uterine sarcomas : a phase II study. Cancer Treatment Report 1986;70:811-6.
121. Slayton RE, Blessing JA, Angel C, Berman M : Phase II trial of etoposide in the management of advanced and recurrent leiomyosarcoma of the uterus : a Gynecologic Oncology Group study. Cancer Treatment Reports 1987;12:1303-7.
122. Hawkins RE, Wiltshaw E, Mansi JL : Ifosfamide with and without Adriamycin in advanced uterine leiomyosarcoma. Cancer Chemother Pharmacol 1990;26(suppl):26-30.
123. Muss HB, Bundy BN, Adock L, Beecham J : Mitoxantrone in the treatment of advanced uterine sarcoma : a phase II trial of the Gynecologic Oncology Group. Am J Clin Onco! 1990;13:32-.
124. Slayton RE, Blessing JA, Look K, Anderson B : A phase II Clinical trial of daiziquone (AZQ) in the treatment of the patients with recurrent leiomyosarcoma of the uterus : Gynecologic Oncology Group study. Invest New Drug 1991;9:207-12.
125. Thigpen TJ, Blessing JA, Beecham J, Homesley H, Jordan E : Phase II trial of cisplatin as first-line chemotherapy in patients with advanced or recurrent uterine sarcomas : Gynecologic Oncology Group study. J Clin Oncol 1991;9:1962-8.
126. Sutton GP, Blessing JA, Barrett RJ, McGehee R : Phase II trial of ifosfamide and mesna in leiomyosarcoma of the uterus : a Gynecologic Oncology Group study. Am J Obstet Gynecol 1992;166:556-70.
127. Omura GA, Blessing JA, Major F, Lifshitz S, Ehrlich CE, Mangan C : A randomized clinical trial of adjuvant Adriamycin in uterine sarcomas : a Gynecologic Oncology Group study. J Clin Oncol 1985;3:1240-5.
128. Hannigan EV, Freedman RS, Rutledge FN : Adjuvant chemotherapy in early uterine sarcoma. Gynecol Oncol 1983;15:56-60.
129. Piver MS, Barlow JJ, Lele SB, Yazigi R : Adriamycin in localized and metastatic uterine sarcomas. J Surg Oncol 1979;12:263-8.
130. Hornback NB, Omura G, Major FJ ; Observation on the use of adjuvant radiation therapy in patients with stage I and II uterine sarcoma. Int J Radiation Oncology Biol Phys 1986;12:2127-31.
131. Rose PG, Boutselis JG, Sachs L ; Adjuvant therapy for stage I uterine sarcoma. Am J obstet Gynecol 1987;156:660-6.