A rare placental site trophoblastic tumor (PSTT) in a 39-year-old female was studied. This tumor, protruding into the uterine cavity, was histologically similar to tumors in previously reported cases of PSTT. Ultrastructurally, the characteristic finding was the presence of perinuclear filaments. Also, the tumor cells were strongly positive for hPL by immunohistochemical method. These findings suggest that this was a tumor caused by neoplastic proliferation of the extravillous intermediate trophoblast.

Key words: Placental site trophoblastic tumor - Intermediate trophoblast - Immunohistochemistry - Electron microscopy

INTRODUCTION
Placental site trophoblastic tumors (PSTT), formerly called "trophoblastic pseudotumors" are a rare form of gestational trophoblastic tumors. Although originally described as benign, they have occasionally been associated with malignant behavior. Recently, we discovered and examined a case of a placental site trophoblastic tumor. In this report, we describe this rare case along with the results of immunohistochemical and ultrastructural examinations.

MATERIALS AND METHODS
For electron microscopy, tumor tissues were fixed with 2.5% glutaraldehyde for 2 hr at 4°C, then with a 1% osmium tetroxide solution for 2 hr at 4°C, and embedded in Epok 812. Ultrathin sections were cut by an LKB Ultrotome with a diamond knife, and double-stained with uranyl acetate and lead citrate. The sections were examined and photographed by an Hitachi H-7100 electron microscope at 75 kV. Immunohistochemical studies were performed using paraffin-embedded sections by the avidin-biotin-peroxidase method. The primary antibodies used were those against human chorionic gonadotropin (hCG), human placental lactogen (hPL), epithelial membrane antigen (EMA), and cytokeratin. All antibodies were purchased from Dakopatts. Flow cytometric determination of tumor cell DNA content was performed on the paraffin-embedded tissue using the technique of Schutte et al.

CASE REPORT
A 39-year-old woman, gravida 4, para 2, was admitted to the Katsunan Hospital in October, 1994, complaining of abnormal uterine bleeding. Her menstrual cycles had been regular since her last pregnancy three years ago. Endometrial curettage was performed for possible ectopic pregnancy. Ultrasonographic examination of the uterus showed thickening of the endometrium. Laboratory data showed a slight elevation of hCG (97 mIU/ml; normal, <1 mIU/ml) and β-hCG (1.0 ng/ml; normal, <0.2 ng/ml). HPL was within normal limits. A total hysterectomy with right oophorectomy was performed after diagnosis of a trophoblastic tumor in November, 1994. A soft tan-yellow protruding tumor, measuring 2.5 × 2.2 × 1.5 cm, was found in the submucosa of the uterine body with identifiable invasion into the myometrium.

RESULTS
Endometrial curettages showed a relative monomorphic population of atypical trophoblastic cells.
Histological examination of the tumor in the uterine body revealed proliferation of ovoid to polyhedral cells with abundant cytoplasm resembling intermediate trophoblastic cells. Most of the tumor cells were mononucleate, and some were binucleate or multinucleate. Though nuclear atypia of the individual cells was seen, mitotic figures were rare. The tumor cells were proliferating between muscle fibers and bundles without destroying them (Fig. 1a). They also invaded the vascular walls. A few cells resembling syncytiotrophoblasts were seen. Foci of hemorrhage and deposition of fibrinoid material were seen among trophoblastic cells. Immunohistochemical study showed that the majority of the tumor cells were strongly positive for hPL (Fig. 1b), but hCG were focally positive only. Cytokeratin and EMA were also present in the tumor cells. Ultrastructurally, the tumor cells had occasionally blunt or irregular microvilli and junctional complexes on the plasma membrane. The nuclei of those cells showed variations in size and shape and had one or two nucleoli (Fig. 2). In some tumor cells, the nuclei were irregular, especially those of multinucleate cells. The cytoplasm contained abundant rough endoplasmic reticulum which was partially dilated and numerous free ribosomes. A few syncytiotrophoblast-like cells were also present. A characteristic feature of this tumor was the presence of the abundant intermediate filaments around nuclei (Fig. 3). Perinuclear filaments were also identified in the cytoplasm of the multinucleate trophoblastic cells, and on occasion, they were aggregated in bundles (Fig. 4). Flow cytometric analysis revealed diploids with a DNA index of 1.0.

**DISCUSSION**

Placental site trophoblastic tumors are neoplastic proliferations of intermediate trophoblastic cells similar to those found in the placental bed. They have been described as “trophoblastic pseudotumors” to indicate their non-neoplastic characteristic by KURMAN et al. Histologically, it may be difficult to distinguish PSTT from choriocarcinoma, or an ‘exaggerated placental site’ from a ‘placental site nodule or plaque’ in an endometrial curettage specimen. Immunohistochemical stainings for hPL, EMA, and cytokeratin are useful in distinguishing non-trophoblastic tumors, because intermediate trophoblastic cells are positive for all three markers. Ultrastructurally, the presence of perinuclear filaments is extremely useful in the differential diagnosis, since prominent perinuclear filaments are not seen in the intermediate trophoblasts of choriocarcinoma. Therefore, we conclude that the pathological features of our case’s tumor, including the strongly positive hPL and perinuclear filaments seen ultrastructurally, are characteristic of PSTT. In a review of follow-up studies of approximately 90 cases of PSTTs, 20 cases had behaved in a malignant fashion. These findings indicate that some of these tumors have close relationships to high-graded

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**Fig. 1.** a: Microscopically, the tumor consists of sheets of intermediate trophoblastic cells invading the myometrium. ×10. b: Immunohistochemically, most of the tumor cells show a positive immunoreaction for hPL. ×10.