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Three-dimensional virtual histology of benign and malignant endometrial stromal neoplasms: a new perspective on why morphology matters

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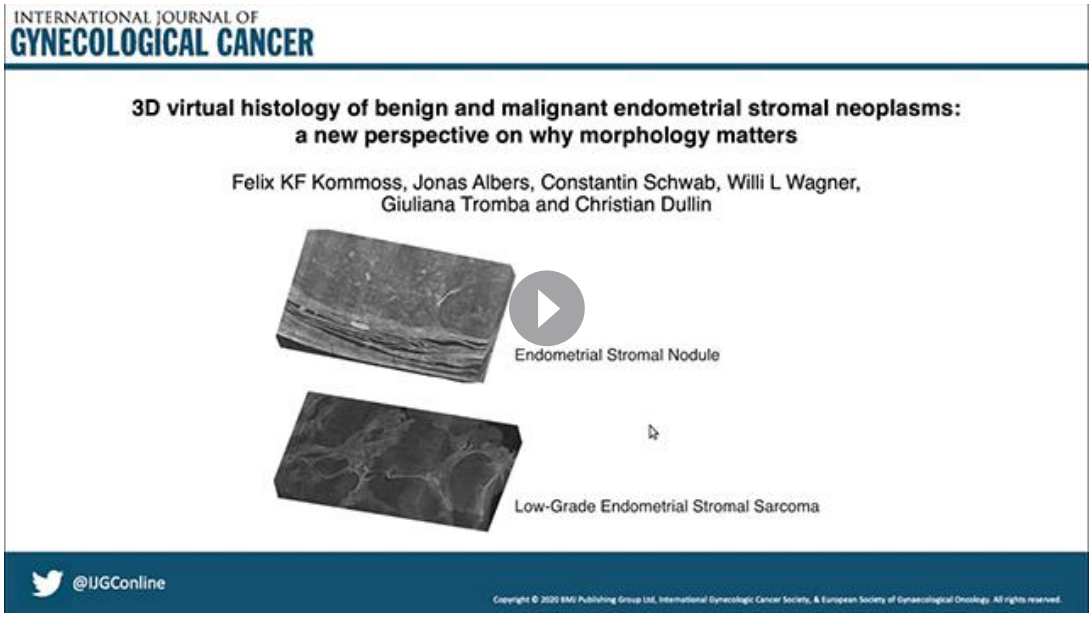
A perimenopausal woman presented with a history of hypermenorrhea and enlargement of uterine fibroids. Histopathological examination of curettage material showed fragments of a mesenchymal neoplasm consisting of small and monomorphic spindle cells with scant cytoplasm, reminiscent of non-neoplastic proliferative phase endometrial stroma. The patient underwent hysterectomy to rule out malignancy. Gross examination revealed an intramural mass located within the uterine corpus. Histologically, characteristic finger-like projections of neoplastic stromal cells, infiltrating the myometrium, were seen. Based on the invasive nature of the neoplasm, a diagnosis of low grade endometrial stromal sarcoma (LGESS) was rendered, and the patient was scheduled for further tumor staging and regular follow-up cancer care, due to the metastatic potential of LGESS. Synchrotron phase contrast micro-CT (SRμCT) of formalin fixed, paraffin embedded tumor tissue provided a remarkably detailed three-dimensional view of the tumor's distinctive invasive growth pattern (Video 1).[1]

An invasive growth pattern and/or lymphovascular invasion are the only features reliably discriminating LGESS from endometrial stromal nodule (ESN), its benign and molecularly often indistinguishable (eg, identical *JAZF1-SUZ12* gene fusion) counterpart.[2] Therefore, the distinction between ESN and LGESS cannot be made with certainty on the basis of limited tissue samples, such as curettage, but requires evaluation of the entire tumor interface with adjacent myometrium, usually in hysterectomy specimens. Once clinically implemented, novel micro-radiological techniques, allowing for higher spatial resolution and superior soft tissue contrast in comparison with



Video 1 Synchrotron phase contrast micro-CT (SRμCT) based three-dimensional virtual histology shows the growth patterns of low grade endometrial stromal sarcoma, and endometrial stromal nodule, its benign counterpart.

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imaging techniques currently in clinical use, may facilitate clinical decision making by identifying patterns indicative of malignancy in cases of uterine stromal neoplasms where a fertility sparing surgical approach might be considered.[3]

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