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The Sick Breast Lobe Has a Testicular Counterpart

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A 31-year-old patient underwent a left orchiectomy in 2012 for a pT1 mixed germ cell tumor, mainly consisting of seminoma, associated with extensive germ cell neoplasia in situ (GCNIS) in the residual surrounding parenchyma. In view of these findings, surveillance of the right testis by ultrasound was performed, which showed in October 2018 a lesion of 11 mm in the inferior and a lesion of 7 mm in the superior part of the testicular parenchyma. Intraoperative frozen section was performed on the lesions, showing that both consisted of pure seminoma. Consequently, a right orchiectomy was performed. The resection specimen was extensively sampled, but showed no additional invasive tumor; the small seminoma foci were completely removed via the frozen section. However, the samples taken randomly from the parenchyma showed a wedge-shaped and sharply delineated area of GCNIS, and this impression on the hematoxylin and eosin sections was confirmed and highlighted on the staining for podoplanin. The GCNIS was distributed in a striking lobar-like fashion (Figure 1 and 2).

The specific clinical setting of this patient enabled us to examine almost completely the parenchymal territory of a testis at risk for germ cell neoplasia, but for the largest part "undisturbed" by an invasive tumor that could distort the geography of preexisting GCNIS. In fact, this can be considered as a kind of "experiment of nature," and we took advantage of this specific setting to report that GCNIS was present in a strikingly lobar and sharply delineated pattern of distribution in the testicular parenchyma, yielding evidence that the "sick breast lobe" has a testicular counterpart. Indeed, it has been hypothesized that ductal carcinoma in situ (DCIS) of the breast is a lobar disease, meaning that some breast lobes are prone to develop cancer while others are not.[1] This "sick breast lobe" theory states that the involved lobes are genetically misconstructed at birth and that further accumulation of genetic aberrations during the following decades ultimately leads to DCIS presenting in a specific pattern that can be explained by accepting this hypothesis. This hypothesis does not only propose a mechanism of DCIS development but also has implications for its diagnosis and treatment.[2]

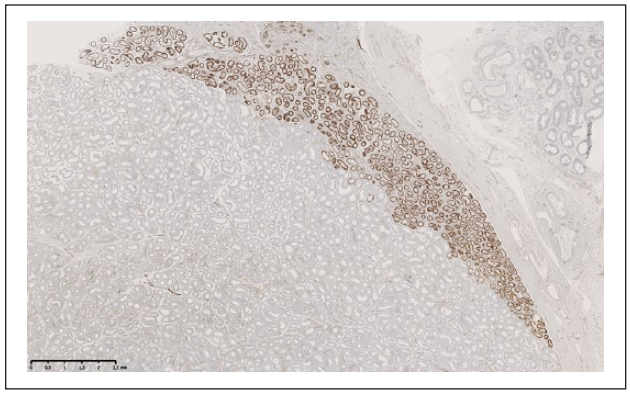

Figure 1. Podoplanin staining illustrating the wedge-like, lobar-like distribution of germ cell neoplasia in situ, sharply demarcated from the surrounding parenchyma.

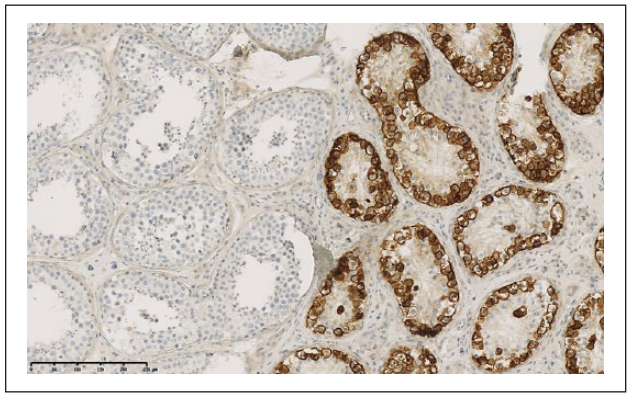

Figure 2. Podoplanin staining showing the abrupt transition from normal seminiferous tubuli with spermatogenesis to tubuli completely involved by germ cell neoplasia in situ.

Until now, this theory only applied to the breast, but our findings indicate it might also exist in the testis, which is

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an organ that is also characterized by a lobar/lobular structural organisation.[3] Further studies of similar patients presenting in this rare setting will be needed to learn more about the "sick testicular lobe."

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