A clinical and molecular project on gonadoblastoma needs international collaboration

Nicolas Kalfa,[1,3] Olivier Maillet,[1] Charles Sultan[1,2]

[1]Service d'Hormonologie, Hôpital Lapeyronie, CHU de Montpellier et UM1, Montpellier, France; [2]Unité d'Endocrinologie et Gynécologie Pédiatriques, Service de Pédiatrie, Hôpital Arnaud de Villeneuve et UM1, CHU de Montpellier, France; [3]Service de Chirurgie et Urologie Pédiatrique, Hôpital Lapeyronie, CHU de Montpellier et UM1, Montpellier, France

Gonadoblastoma (GB) is a specific and unusual tumor developed by patients presenting a disorder of sex development (DSD). The term gonadoblastoma was first introduced in 1953[1] to designate a steroid hormone-secreting gonadal tumor. This name was chosen because the neoplasm appeared to recapitulate gonadal development more completely than any other type of tumor. In 1970, Scully[2] reported 74 cases of GB and precisely defined it as the association of embryonic germ cells and supportive cells that resemble immature Sertoli/granulosa cells in a context of gonadal dysgenesis (GD).

First, the natural history of GB remains unclear. Patient phenotypes are often female but some degree of masculinization is possible.[3] Diagnosis is frequently made during consultation for primary amenorrhea with the discovery of Swyer syndrome. Tumor secretion may also induce the development of secondary sexual characteristics and diagnosis after secondary amenorrhea has been described. Patients with true hermaphroditism can also present with GB.

Second, the predictive factors of GB development are largely unknown. Although Page[4] hypothesized that GB development is dependent on the presence of part of the Y chromosome, known as the GBY region, tumor occurrence remains multi-factorial. The overall tumor risk is evaluated at 30% for complete gonadal dysgenesis and is variable for other cases of dysgenesis. Apart from the presence of Y material, no other risk factor has been found. Moreover, GB can be a precursor of dysgerminoma, but the predictive factor for the transformation into an aggressive cancer is again unknown.[3,5] An early prophylactic gonadectomy has thus been advocated for many patients with GD. In order to provide better guidelines for making therapeutic decisions about patients with DSD and to prevent abusive gonadectomy, we plan to perform a clinical, immunohistochemical and genetic study on gonadoblastoma. Hence, we here present an international call to perform a multicenter analysis of this rare tumor. The first objective is to characterize in detail the epidemiological factors, the diagnostic circumstances, and the hormonal profiles of patients with GB. This data collection will define the specific characteristics of these patients, guide subsequent research, and enable us to test the correlation of these characteristics with histological criteria. Then, analysis of the molecular profile of this tumor will focus on sexual determination factors (*SOX9, FOXL2*), pluripotency and differentiation factors (OCT3/4). Both expression of candidate genes inside the tumor and their direct sequencing on tumor DNA (*SOX9, FOXL2, TSPY*) could provide new pathophysiological insights into GB.

For this purpose, we would appreciate receiving the following: (i) a short report of the patient history recorded on a specific patient form and (ii) ten uncolored slides of the tumor, with if possible frozen tissue.

Overall, the pathophysiology of GB development is unknown. A collaborative international study will bring much needed information on the connections between tumorogenesis and developmental abnormalities, and could improve the follow-up of patients with DSD, while reducing the rate of prophylactic gonadectomy.

Correspondence: Charles Sultan, Unité d'Endocrinologie-Gynécologie Pédiatriques, Service de Pédiatrie 1 Hôpital Arnaud de Villeneuve, CHU Montpellier, 34295 Montpellier, France. E-mail: c-sultan@chu-montpellier.fr

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