Letter to the Editor

Charles Emmanuel Sédillot and Émile Küss: The first cancer biopsy

I read with great interest the recent article by Franck Billmann on Charles Emmanuel Sédillot.1 This paper describes his early life and training, his brilliant career as a military surgeon, his ~30 years as Chair/Professor of Clinical Surgery at University of Strasbourg, the surgical techniques/instruments he developed, his role in the introduction of surgical anesthesia in France, his books and papers, his pioneering observations related to surgical sepsis (predating both Semmelweis and Lister), and his recognition by Louis Pasteur for having coined the term “microbe”.1 The paper briefly mentions that Sédillot, along with Émile Küss [Head of Anatomical Studies (appointed 1843) and Professor of Physiology (appointed 1846) at University of Strasbourg]2 made major contributions to microscopy and histopathology. In this brief report, I make the case that Sédillot and Küss not only made a fundamental contribution to the definition of cancer, they actually performed the first documented tumor biopsies. Since this topic is not addressed in the other paper on Sédillot3 and since I am unaware of any biographical papers about Küss, it seems appropriate to make this case here.

Within a decade of the establishment of cell theory by Matthias Schleiden and Theodor Schwann in 1838–39, there were a few researchers suggesting that cancers could be distinguished from normal tissues under the microscope; however, this distinction required seeing cancer cells in very large groups (histology) rather than in small numbers or individually (cytology).4 The most prominent experts in pathology and other elite cell/cancer researchers were of mixed opinion on whether the microscope would ever be useful for diagnosis of cancer (i.e., as opposed to cancer research) and were uniformly and vehemently opposed the idea that cancers cells were “unique”.4,5 In fact, the de facto anatomical pathological “definition” of cancer for up to another 90 years was based upon the observed “behavior” of the cancer cells (i.e., the ability to invade locally and metastasize), not their morphologic appearance.6,7 These beliefs precluded the widespread use of biopsies and cytopathology in cancer diagnosis for the better part of a century.7,8

Sédillot and Küss were among the mavericks who ignored dogma and advanced science based upon their own observations. Historians of cancer biology have credited Danish pathologist Adolph Hannover with the first definitive microscopic description of a cancer cell in 1843.4 Hannover’s concept that individual cancer cells could be distinguished from other cells based upon microscopic morphological features was supported by only three contemporaries4: Hermann Lebert9 in 1845, Sédillot (with histologist colleague Küss) in 1846, and Heinrich Meckel in 1846 (although later an accomplished pathologist, Meckel had just finished medical school and lacked scientific gravitas10). Sédillot published his and Küss’ observations about microscopic diagnosis in 18464 and within a year they had put their observations to practical use, developing a punch biopsy instrument and performing cancer biopsies. According to Küss:

“On plunging this instrument into a tumor to any depth, we can extract a minute portion of the tissue of which its various layers are composed. In this manner a microscopic examination of the tumor can be practiced on the living subject, and its nature ascertained before having recourse to an operation.”11

Fig. 1. Émile Küss, permission from Bibliothèque nationale et universitaire de Strasbourg.
As a pathologist who has written extensively on the history of biopsy, to the best of my knowledge, these were the first surgical biopsies, predating Carl Ruge, generally considered the father of biopsy, by more than 30 years.

Küss, at the time of his presentation at the Strasbourg Medical Society, had used this technique to make diagnoses three times, but, unfortunately, the innovation of this ground-breaking surgical pathological team was truncated a year later, as Küss abruptly ended his scientific career, entering the very rough world of Franco-Prussian politics. In fact, Küss’ hard-hitting political communications quickly landed him in jail but was acquitted a few months later. Küss remained a political activist for the rest of his life and was serving as mayor of Strasbourg at the time of its capitulation to the Prussian army on September 27, 1870. Less than 5 months later, Küss was elected to the National Assembly to represent the Lower Rhine with more than 96% of votes cast. One month later, he died of a heart attack when he heard that his colleagues in the National Assembly were ceding Strasbourg, most of Alsace and part of Lorraine to Germany. The Franco-Prussian War of 1870 also affected Sédillot, who had retired from military surgery, as he quickly had “sad occasion to delve back into war surgery.”

While Sédillot and Küss never worked together again, their paths are forever linked as both now have streets in Paris named after them: the prominent surgeon’s street, Rue Sédillot, is in the upscale 7th District and populist politician/physiologist’s street, Rue Küss, is in the densely populated and ethnically diverse 13th District.

Ethical approval
None.

Funding
No financial ties to a funding source.

Author contribution
I acquired all data and conceived, wrote and approved submission the paper.

Conflicts of interest
None.

References
5. Wolff J. The science of cancerous disease from earliest times to the present. Science History Publications USA (Watson Publishing International); 1989 [originally published in German in 1907].

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20 November 2012
Available online 5 December 2012