First developed in 1957, confocal microscopy is a powerful imaging tool that can be used to obtain near real-time reflected light images of untreated human tissue with nearly histologic resolution. Besides its research applications, in the last decades, confocal microscopy technology has been proposed as a useful device to improve clinical diagnosis, especially in ophthalmology, dermatology, and endomicroscopy settings, thanks to advances in instrument development. Compared with the wider use of the in vivo tissue assessment, ex vivo applications of confocal microscopy are not fully explored. A comprehensive review of the current literature was performed here, focusing on the reliable applications of ex vivo confocal microscopy in surgical pathology and on some potential evolutions of this new technique from pathologists' viewpoint. PMID:27058244 DOI:10.1097/PAP.0000000000000114