The 27 December 1722 Algarve earthquake destroyed a large area in southern Portugal generating a local tsunami that inundated the shallow areas of Tavira. It is unclear whether its source was located onshore or offshore and, in any case, what was the tectonic source responsible for the event. We analyze available historical information concerning macroseismicity and the tsunami to discuss the most probable location of the source. We also review available seismotectonic knowledge of the offshore region close to the probable epicenter, selecting a set of four candidate sources. We simulate tsunamis produced by these candidate sources assuming that the sea bottom displacement is caused by a compressive dislocation over a rectangular fault, as given by the half-space homogeneous elastic approach, and we use numerical modeling to study wave propagation and run-up. We conclude that the 27 December 1722 Tavira earthquake and tsunami was probably generated offshore, close to 37 degrees 01'N, 7 degrees 49'W.