When gynecological brachytherapy patients are treated with tandem and ovoids, the applicators are inserted into the patient, x-rays are taken in order to determine the radiation dose distribution, and subsequently the radiation sources are loaded into the applicators. Current treatment planning systems assume the sources are stationary in relationship to the patient's anatomy; however, this is not the case. We have measured the surface dose with thermoluminescent dosimeters (TLDs) on several patients receiving brachytherapy treatments with tandem and ovoid applicators and have developed a computer program to accurately calculate the dose to the surface of the patient. We have compared the measured doses to the calculated doses from our computer program with the dose calculations from current treatment planning systems. By comparing the calculated doses to measured doses, we have estimated the variation in dose distribution to the patient due to source motion relative to the patient. The estimations for several different patients will be presented.