Segmentation methods are an essential part of the simultaneous machine translation process because, in the ideal case, they split the input into chunks whose translation is independent of any forthcoming context. Furthermore, the optimal splitting should also ensure that the segments with the previous characterization have minimal lengths. However, there is still no agreement about the rules that should produce such an optimal splitting. Therefore, we started with the annotation of the ESIC dataset by simulating a perfect human interpreter with an infinite amount of time and resources. Then we proposed multiple segmentation methods that we compared to each other in terms of segments' lengths, counts, and statistics of the most frequently split types of words. Apart from the segmentation methods, we also implemented and analyzed two variants of neural machine translation models – one trained solely on complete sentences and the other finetuned with partial translations. Finally, we evaluated the translation quality and delay of segments produced by splitting methods with the SLTev evaluation toolkit and discussed the effect of both machine translation models on the results.