Selective regular and irregular English past tense deficits have been associated with non-overlapping areas of brain damage, implying two functionally distinct, neural pathways for language processing. Thus, a dorsal pathway that processes words as sequences of morphemes (jump-ed) can be distinguished from a ventral pathway that processes morphologically unstructured words (e.g. brought). It is unclear however, which regions are critical components of the dorsal pathway because the lesions associated with regular past tense deficits can encompass multiple cortical and subcortical structures. To delineate the brain regions essential for processing complex word structure we tested the claim that these include the basal ganglia (Ullman et al. 1997). We investigated seven patients with cerebrovascular damage affecting the basal ganglia using measures designed to diagnose selective regular or irregular past tense deficits (Tyler et al. 2002; Ullman et al. 1997). The patient group showed a normal pattern of auditory priming from both the regular and the irregular past tense (e.g. jumped/jump, brought/bring). In past tense elicitation tasks most patients performed at ceiling when inflecting regular verbs and nonsense words for tense. In contrast, they made errors producing the irregular past tense, providing the only consistent evidence for a past tense deficit in this patient group. These results suggest that there is no reliable association between cerebrovascular damage to the basal ganglia and regular past tense deficits in either language comprehension or production. Thus, the basal ganglia are unlikely to be critical components of a dorsal pathway for processing complex word structure.