Let $t_C$ be a Dehn twist about a nonseparating curve $C$ in a surface $G$ of genus $g+1$. A fractional power of $t_C$ of exponent $\ell/n$ is a homeomorphism $h$ such that $h^n$ is isotopic to $t_C^\ell$, that is, $[h]^n = [t_C]^\ell$ in the mapping class group of $G$. In particular, a root of $t_C$ of degree $n$ is just a fractional power of exponent $1/n$. A fractional power is side-exchanging (SE) if it interchanges the two sides of $C$, and side-preserving (SP) otherwise. As the main result, we state necessary and sufficient conditions for the existence of an SE or SP fractional power of $t_C$ of degree $\ell/n$. We will also state some applications of the main result in both cases. (Received September 16, 2010)