The reaction of Y(NO$_3$)$_3$/5H$_2$O and 2,2':6',2''-terpyridine (terpy) in MeCN leads to [Y(NO$_3$)$_3$(terpy)(H$_2$O)] (1) and [Y(NO$_3$)$_3$(terpy)(H$_2$O)]·terpy·3MeCN (2) in good yields depending on the isolation conditions. The structures of both complexes were determined by single-crystal X-ray crystallography. The Y$^{III}$ atom in 1 is 9-coordinate and ligation is provided by one terdentate terpy molecule, two chelating nitrates, one monodentate nitrate and one terminal H$_2$O molecule; the coordination polyhedron about the metal may be viewed as a tricapped trigonal prism. The Y$^{III}$ atom in 2 is 10-coordinate and its coordination sphere consists of three nitrogen atoms from the terdentate terpy, six oxygen atoms from the three chelating nitrates (one of them being “anisobidentate”) and one oxygen atom from a terminal H$_2$O molecule; the polyhedron about the metal may be viewed as a distorted sphenocorona. The interstitial terpy is strongly hydrogen-bonded to the O atom of the coordinated H$_2$O molecule to form [Y(NO$_3$)$_3$(terpy)(H$_2$O)]·terpy pairs. The new complexes were characterized by IR and $^1$H NMR spectroscopies. The Y$^{III}$/NO$_3$⁻/terpy chemistry is compared to the already well-developed Ln$^{III}$/NO$_3$⁻/terpy chemistry (Ln = lanthanide).