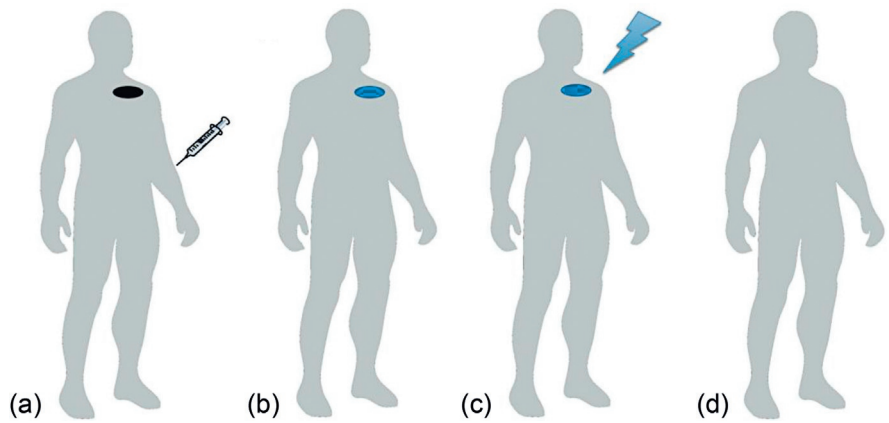

FIGURE 4.53

Schematic representation of the clinical procedure for cancer photodynamic therapy.

Adapted from reference 158.

Photodynamic therapy has been in clinical use for a long time, initially for skin cancers. Subsequently, it has been established as a therapeutic strategy for other types of cancer, such as cervical, esophageal, early stage central type lung,[138] and head and neck cancers,[139] among other applications.[140,141] It has the disadvantage of requiring hospitals to make an expensive capital expenditure on laser machinery.

12.1 PORPHYRINS AS PHOTOSENSITIZERS

Among the many compounds investigated as photosensitizers for PDT,[142] most work has been carried out with porphyrin-based drugs. Porphyrins are aromatic, highly conjugated heterocycles, with a core of four pyrrole rings coupled through four methylene units, that contain 11 conjugated double bonds, leading to light absorption in the red region of the visible spectrum. The excited state thus generated can lead to the formation of singlet oxygen and ROS species (Figure 4.54). Chlorins are analogs of the

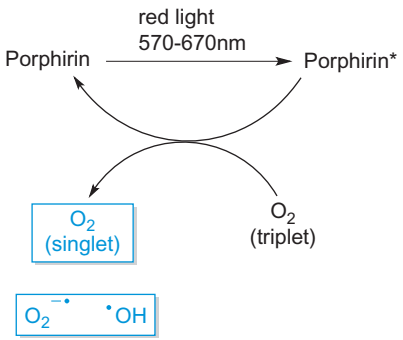

FIGURE 4.54

Photoactivation of porphyrins.