Figure S1. Work Flow

In-vitro study

Development of intraoral OCT probe

SD-OCT system Telesto-II SP 2, hand-held scanner OCTH-1300NR, endoscopic probe Technical optimization, comparison with the standard OCT probe OCTG-1300 Mounting on a mobile custom build card system for chairside use

Extracted human healthy/carious anterior/posterior teeth

N = 20

Unrestored/restored with composite Patient-equivalent simulation

OCT cross-sectional imaging

Hard tooth tissues, structural defects, cavitated/non-cavitated proximal lesions, composite restorations, interfacial adhesive defects, imperfections in restoration materials

Verification of the signals: X-ray microtomography, light microscopy

In-vivo study Caries diagnosis

In-vivo study Tooth-colored restorations

N = 4 volunteers

N = 10 volunteers

64 unrestored posterior teeth

Proximal healthy and carious regions

10 anterior/posterior teeth

Hard tooth tissues, gingiva Composite restorations (Class I, II, V), composite inlays, ceramic crowns

Cleaning, air-drying, photographic documentation

Cleaning, air-drying, photographic documentation

Diagnostic techniques

Visual inspection, FOTI, Bitewing radiography, Intraoral OCT imaging

Diagnostic techniques

Visual inspection Intraoral OCT imaging

Scoring 0/1 and statistical analysis

Contingency tables, statistical comparison of methods

Qualitative evaluation of OCT cross-sectional images

Display of hard tooth tissues and inherent structural defects, gingiva, tooth-restoration bond, interfacial adhesive defects, sealing of cavity surfaces with adhesive, imperfections in restorations