

Adhesives in orthopaedic surgery. A review of the literature and in vitro bonding strengths of bone-bonding agents.

Authors: Weber S.C., Chapman M.W.

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Abstract:

Adhesives may offer a number of advantages over conventional metal osteosynthesis in the treatment of fractures: ease and speed of fixation are improved, they have the anatomy to anatomically coapt small fragments, and hardware removal is not necessary. A review of the literature was performed to evaluate experiments with collagen and other biologic adhesives, epoxy resins, polyurethane foam, cyanoacrylates, zinc polycarboxylate, polymethylmethacrylates, and fibrin adhesives pertaining to osteosynthesis. Cyanoacrylates, polymethylmethacrylates, and fibrin adhesives are currently being investigated. These agents are tested to evaluate their bone-bonding strength. Cyanoacrylates of biologically tolerated chain length did not develop useful bonding in cancellous bone; they bond well to cortical bone only with meticulous surface preparation. Fibrin adhesives developed only minimally useful bonding. Polymethylmethacrylate developed surgically useful bonding in osteosynthesis where conventional fixation is impossible.