Safety and utility of cyanoacrylate adhesives in creating layered septal cartilage grafts in open structure septorhinoplasty

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Background
Reliable and reproducible results in open structure rhinoplasty depend upon structurally sound cartilage grafting. This may be very challenging among patients who have suffered nasal trauma or have undergone prior nasal/septal surgery. The creation of layered or overlapping grafts from shorter cartilage remnants is oftentimes tedious and difficult. Harvest of costal or conchal cartilage among patients with septal cartilage-deficient noses results in secondary donor site morbidity. The present study evaluated the safety and utility of cyanoacrylate-based adhesives in creating layered septal cartilage grafts for open septorhinoplasty.

Study Design:
Retrospective clinical review at a tertiary care center.

Methods
Chart review identified patients undergoing primary or revision open structure rhinoplasty with minimum thirty (30) day follow-up. All procedures involved creation of a layered caudal or dorsal strut graft that was constructed using at least two smaller autologous septal cartilage grafts. The grafts were adhered together with cyanoacrylate-based adhesive(s) and 5-0 PDS suture to create a bolstered, elongated graft. The efficacy and safety of the procedure was subsequently assessed postoperatively.

Technique
Open rhinoplasty approach demonstrating severe caudal septal deviation or severe septal trauma with fracture.

After extra-corpooreal septoplasty is performed, the usable, straight segments of septal cartilage are used to prepare an elongated dorsal and/or caudal strut reconstruction. This is then inset and secured with 5-0 PDS sutures.

Results
Fifteen patients were included. Mean patient age was 39 years (range 15-65). Fifty-three percent of patients had undergone prior nasal surgery: prior external septorhinoplasty (7), prior sepoloplasty (1). Median follow up was 144 days (range 45-405 days). One patient developed a fluid collection at the posterior septal angle approximately 6 months postoperatively which resolved with drainage and oral antibiotics. Two patients complained of minor septal deviation. There were no other complications.

Discussion
Cyanoacrylate-based adhesives (Histoacryl®, Dermabond®, Indermil®) are among the strongest tissue glues approved for human use. Toxicity is limited and is dependant on the length of the side chains and the rate of chemical degradation. Small quantities may be applied precisely and in a very controlled fashion to cartilage grafts. Cyanoacrylate adhesives are particularly useful for cartilage grafting during revision open structure septorhinoplasty or among patients having suffered severe nasal/septal trauma. During typical revision surgery in the setting of septal cartilage deficiency, the formation of structurally sound caudal and dorsal grafts can be very challenging. In these cases, use of cyanoacrylate adhesives permits the creation of rigid, layered cartilage grafts. In some situations, the use of cyanoacrylate adhesives may obviate the need for autologous or irradiated homograft costal cartilage grafting and their attendant limitations and/or morbidities.

Conclusions
Cyanoacrylate-based adhesives appear safe and effective in the crafting of elongated, layered autologous cartilage grafts to provide reliable tip/dorsal support when performing external rhinoplasty.

References

Histoacryl® registered trademark of TissueSeal, LLC (Ann Arbor, MI)
Dermabond® registered trademark of Ethicon Inc. (Somerville, NJ)
Indermil® registered trademark of Coviden Ltd. (Dublin, Ireland)