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Low cost alternative for high speed drill used in spine surgery

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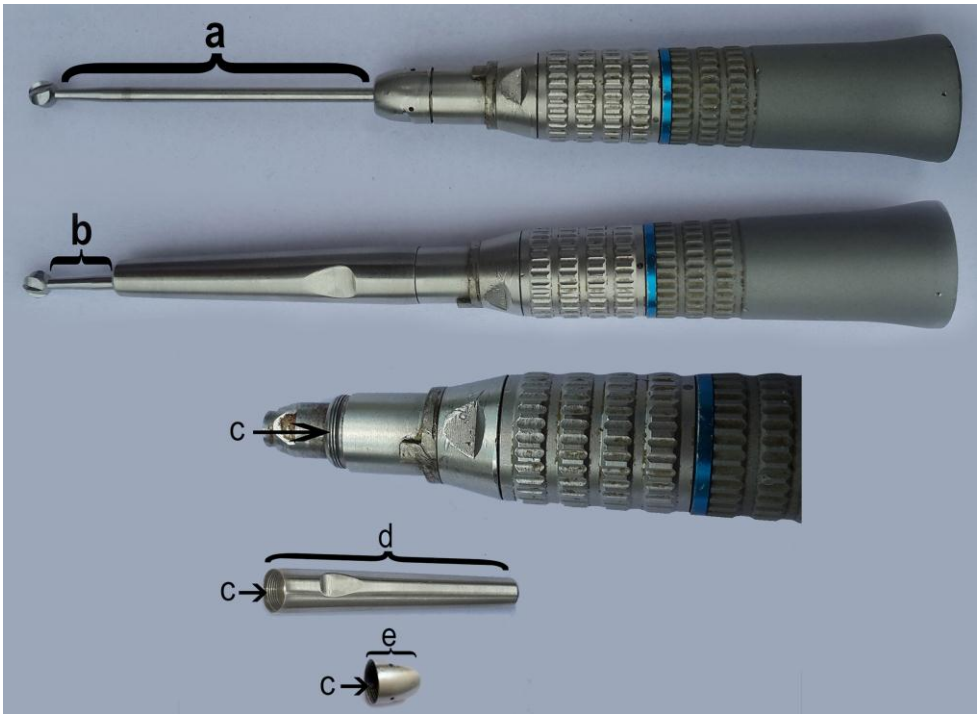
Abstract
High speed drills are routinely used in majority of spine surgery but the cost of the machine and its consumables has restricted its use in developing nations. To reduce the cost and increase the availability of drill the authors have devised a modification in the tip of Handpiece of Dental Micromotor to be safely used in Spine surgery.

Keywords: high speed drill, micromotor, spine surgery

Introduction
High speed drills are routinely used in majority of spine surgery but the cost of the machine and its consumables has restricted its use in developing nations [1]. Low cost indigenous solutions should be applied to reduce the cost [2]. In view of this the authors have devised a novel low cost modification of the Hand Piece of the Dental Micromotor routinely used in dental procedures. Dental Micromotor have been used in past by Spine Surgeons but it has the disadvantage that the length of the exposed shaft of the drill bit is too much which causes damage to the surrounding tissue by wrapping it at the exposed part of the drill bit shaft when (Fig.1a).



1a. Length of the exposed shaft of drill bit
1b. Length of the exposed shaft of drill bit with modified longer tip
1c. Pitch on the Micromotor is similar to that of the original and modified tip
1d. Length of the modified tip is 46mm
1e. Length of the original tip is 8.49 mm

Fig 1

Procedure
To overcome this, the authors replaced the tip of the hand piece of Dental Micromotor which was of 8.49 mm in length longer tip of 46 mm length (Fig. 1b &1d). This longer tip was made using a stainless steel tube with an inner thread of the same pitch as on the handpiece (Fig 1c) using Computer Numerical Control (CNC) machine.

Conclusion
The cost of a Dental Micromotor with handpiece is roughly

USD$ 142 and its bits cost USD $2 each while the cost of the drills used in Spine Surgery is around USD $14000 and its bits Costs roughly USD $70 each. This drill has been used safely and efficiently by the authors in spine surgery cases ranging from Anterior Cervical Discectomy and Corpectomy to Ligamentum Flavum Hypertrophy and Transoral Surgery. This simple modification can drastically reduce the cost and increase the availability in regions like ourswhere the per capita income is USD$ 570 approximately [3].

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