

**ASSESSMENT OF LOW LEVEL LASER THERAPY ON  
RATE OF THE MAXILLARY INCISOR INTRUSION IN  
TREATMENT OF ADULT PATIENTS WITH GUMMY  
SMILE: A RANDOMIZED CLINICAL STUDY**

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## **Abstract**

**Objective:** The current study was a Randomized Controlled Trial (RCT) that was performed to evaluate the effect of low level laser therapy on the rate of maxillary incisor intrusion in adult patients having deep bite associated with gummy smile.

**Materials and Methods:** 24 patients having gummy smile associated with deep bite were enrolled in the study (mean age of 20.4 years). Patients were randomly allocated to one of two intervention groups. Both groups received fixed orthodontic treatment with preadjusted edgewise brackets, segmented levelling and alignment was carried out in upper arch until 17 X 25 STST-inch wire. Additionally, two miniscrew implants (MSI) were inserted between the maxillary lateral incisor and canines, then a total intrusive force of 100 grams was applied and checked with force gauge. “Group A” received LLLT during intrusion while “Group B” was the comparator with no LLLT application. LLLT was applied on day of force application, then days 7, 14, 21,28,42,56 and continued for 2 weeks till the end of follow up period (6 months).

**Results:** The monthly rate of intrusion showed no statistically or clinically significant difference between both groups through the different follow up months with mean rates of 0.7 mm/month and 0.66 mm/month for laser and non-laser groups respectively.

**Conclusion:** Low level laser therapy with the parameters used had no acceleratory effect on the rate of maxillary incisor intrusion.

*To  
My Family,  
For their  
Love  
&  
Support.*

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## List of abbreviations

TADS	Temporary anchorage devices
LLLT	Low Level Laser Therapy
UID	Upper incisor display
PS	Posed smile
RP	Rest position
CAW	continuous arch wire technique
CIA	Connecticut Intrusion Arch
UIA	Utility Intrusion Arch
K-SIR	Kalra's Simultaneous Intrusion & Retraction arch
RCS	Reverse Curve of Spee
SN plane	Sella Nasion plane
PP	Palatal plane
UI	Upper incisor
CN	Centinewton
PDL	Periodontal ligaments
PI	phosphoinositide
DNA	Deoxyribonucleic acid
RANK	Receptor Activator of Nuclear Factor kappa
RANKL	Receptor Activator of Nuclear Factor kappa-B ligand
OPG	Osteoprotegerin
TGF $\beta$	transforming growth factor $\beta$
M-CSF	Macrophage colony stimulating factor
OTM	Orthodontic tooth movement
PTH	parathyroid hormone