

**Surgical Management of Fractured Miniscrew**

Dr Shubangi Mani<sup>1</sup>, Dr Komal Thange<sup>2</sup>, Dr N.G Toshniwal<sup>3</sup>, Dr Nilesh Mote<sup>4</sup>, Dr Jyoti Rajbhar<sup>5</sup>, Dr Devdatta Wankhade<sup>6</sup>, Nilu Singh<sup>7</sup>

<sup>1</sup>Professor and PG Guide, Dept of Orthodontics, RDC Loni

<sup>2</sup>PG student, Dept of Orthodontics, RDC Loni

<sup>3</sup> Professor, HOD and PG Guide, Dept of Orthodontics, RDC Loni

<sup>4</sup>Professor and PG Guide, Dept of Orthodontics, RDC Loni

<sup>5</sup> PG student, Dept Of Orthodontics, RDC Loni

<sup>6</sup>PG student, Dept of Orthodontics, RDC Loni

<sup>7</sup>PG student, Dept of Orthodontics, RDC Loni

**Corresponding Author:** Dr Komal Thange, Post Graduate, Dept of Orthodontics, Rural Dental College, Loni

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**Abstract**

Absolute anchorage provided by miniscrew play important role in success of treatment. Failure of anchorage unit leads to compromised treatment outcome. In this case report, surgical management of fractured miniscrew in the cortical bone between second premolar and first molar in right upper quadrant is reported.

**Introduction**

Absolute anchorage is often required for an orthodontist to improve the clinical outcome and optimize the efficiency and effectiveness of treatment mechanism. Traditionally ankylosed tooth /dental implant provide the absolute anchorage. TAD's or orthodontic miniscrews provide the absolute anchorage. Their usage has increased a lot due to the following: simple use, cost effective, predictable and successful clinical tool in orthodontist's armamentarium. Success rate vary between 83.8%.<sup>1</sup> Failure of miniscrew is attributed to many factors such as bone density, diameter of implant, systemic condition, poor oral hygiene, insertion technique etc. To reduce the

risk of implant failure various measures have to be considered.

**Key word:** Miniscrew fracture, TAD failure

**Case report**

24years female, class II skeletal pattern with increased proclination and gummy smile was reported. Orthodontic camouflage with upper 1<sup>st</sup> premolar extraction was planned.

Absolute anchorage with miniscrew for retraction of the six anteriors was planned with sliding mechanism. Miniscrew (1.5×8)placement between 1<sup>st</sup> molar and 2<sup>nd</sup> premolar bilaterally in upper jaw was decided. During the mini implant placement on right side at the planned position, miniscrew fractured at apical third and was separated inside the cortical bone. Patient was referred to Department of Periodontology for further evaluation. Following procedure were followed in Department of Periodontology for the retrieval of fractured miniscrew.

## Procedure

- Right infraorbital nerve block was given, LA with adrenaline 1:200000.
- A crevicular incision with no.15 blade was given extending from mesial of upper right second premolar to distal of first molar, full thickness flap was elevated with periosteal elevator. Hemostasis was maintained and careful observation was done to identify broken piece of implant. The implant was identified. (Fig. No. 1)
- Osteoplasty with round carbide bur and copious irrigation was done enclosing the implant to be retrieved. Once the portion of the implant was exposed with the help of artery forceps, an anticlockwise motion was given holding the apical separated part of the implant and it was retrieved. (Fig. No. 2) The retrieved implant was of 2mm approx. (Fig No. 4) The area was carefully evaluated and irrigation was done. After closure 3.0 silk sling sutures were given. (Fig No. 3) Post-operative instructions were given. Patient was recalled after 7 days for follow-up and suture removal. The healing was smooth and eventful. (Fig No. 5)

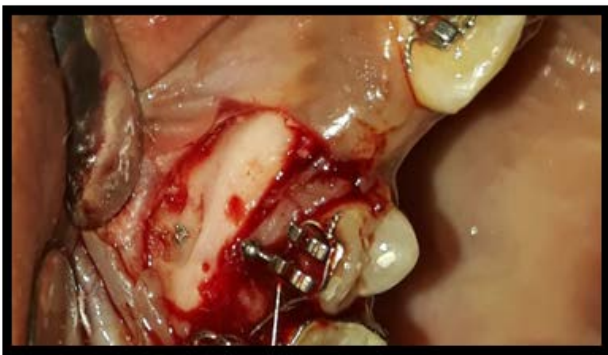


Fig1: Crevicular incision extending from mesial of upper right second premolar to distal of first molar, exposing miniscrew separation site

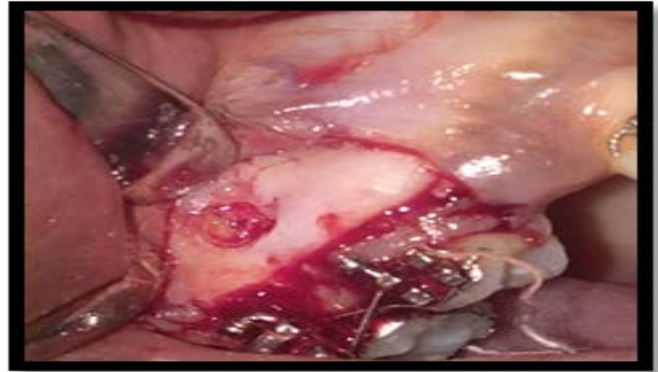


Fig 2: Surgical site after removal of the separated fragment.



Fig 3: Suture with 3.0 silk



Fig 4: Fractured fragment and the total length of screw.

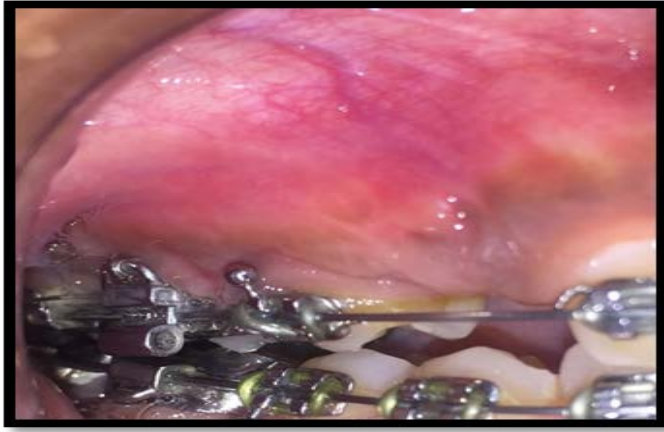


Fig 5: Post healing

### Discussion

Absolute anchorage provided by TAD's, determines the success rate of various orthodontic treatment. Most studies demonstrated success rate greater than 80% with range of 0% to 100%.<sup>2</sup> Failure of TADS is defined as TAD's that must be removed prior to fulfillment of its purpose of providing anchorage.

Failure of TAD depends upon multiple factors:

Patient related factors – age, bone quality, oral hygiene, force of mastication, root perimeter, systemic conditions.

TAD's related factors – diameter, screw length, thread design.<sup>3,4,5</sup>

Multiple measures should be taken to avoid failure

Fractured TAD's have potential to partially Osseo integrate. Fracture can occur during removal. This fracture typically occurs with smaller diameter TAD's i.e. less than 1mm diameter.<sup>6</sup> If fractured TAD is deep in bone it requires surgical removal. Additional surgical procedure with trephine drill is required to remove it. This results in substantial bone loss as well as increased associated surgical morbidity.<sup>7</sup>

### Conclusion

To conclude following factors should be avoided to prevent fracture of miniscrew:

- TAD's less than 1.3mm diameter should not be utilized.

- Avoid intermittent moment during implant placement.
- TAD's should not be inserted beyond its neck.

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