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OPEN VS CLOSED SURGICAL APPROACH TO EXPOSE IMPACTED CANINE

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ABSTRACT

Maxillary canine impaction requires surgical and orthodontic intervention for correction. The aim of this study was reviewing the literature to compare the two methods and establish any superior advantage of one over another in terms of surgical time post-operative pain and gingival inflammation.

In this review article two methods have compared. The methods are "Open and closed Exposure" .The clinical studies about both methods have assessed and the advantages and disadvantages have reported and compared.

This review article showed that after open surgical approach the recovery time of pain and analgesic consumption was longer and oral function was more impaired. It is considered immediate postoperative complications in terms of pain, oral function (ability to eat and enjoy food, mouth opening) and general activity measure.

According to these results there is a clear lack of substantial evidence to demonstrate a definitely different outcome, in choosing a particular surgical approach, open or close. So more randomized clinical trial needs to be conducted in this area, to reach a definitive conclusion enabling clinicians to make clear cut choices.

Keywords: canine impaction, Open and closed Exposure, surgical approach, compare

INTRODUCTION

Maxillary canine impaction is one of the frequent clinical conditions which require surgical and orthodontic intervention for correction.

Presently there are two surgical approaches to expose canine to facilitate bracket attachment.

Aim of this article is to review the literature to compare the two methods and establish

any superior advantage of one over another in terms of surgical time post-operative pain and gingival inflammation.

METHODS

Open and closed Exposure

Maxillary permanent canines usually erupt around the age of 11-12 years. They are considered the second most common impacted teeth after mandibular 3rd molars with a prevalence of 1.5%. (Ericson S, Kurol J. 1987). According to previous studies 85 % of maxillary canines are palatally impacted Rayne J 1969Ericson S. Kurol J (1987). However recent studies by Ericson S and Kurol J 2000, showed only 50 % palatal impaction and 39 % labial impaction.

Palatally ectopic canine aetiology is unclear however according to Peck S. Peck L., Kataja M. 1994 and 2002 it could be polygenic and multifactorial.

Tooth germ position, inadequate space, genetics and loss of guidance have been indicated in literature. (Jacoby H. 1983), (Becker A 1998), (Kurol J 1997).

There are currently two different approaches to expose the impacted canine before orthodontic repositioning: open and closed surgical approach.

In closed surgical approach:

-Full thickness palatal flap is raised including the periosteom, preserve the nerve bundle.

-Ostectomy is done to expose the crown of the canine up to cement enamel junction.

-Bracket with chain is bonded to most accessible surface of the tooth.

-Flap is repositioned making sure the opening of the flap is large enough otherwise canine eruption will be slowed down.

-The chain is then placed around the orthodontic wire until after 7 to 10 days when the traction is activated.

- A periodontal pack should be placed to prevent the tissue from covering the opening.

Same initial surgical procedure is applied for the open exposure except no bracket is attached at the time of surgery, palatally impacted canine will erupt on its own in about 6 to 8 months at which point a bracket is placed on the tooth and tooth is dealt with orthodontically (Vincent G. Kokich).

Choosing the right method depends of surgeon's experience and orthodontist preference however it is mostly determined by position of the tooth and possibility of bracket attachment on the appropriate surface.

Oral Hygiene and gingival inflammation:

The palatally impacted canine is a challenging orthodontic problem and needs surgical and orthodontic cooperation, according to A.Schmidt.

The initial positioning of the palatally impacted canines can have detrimental effect on health of periodontal fibres of canines and the neighbouring teeth Egle Zasciurinskiene et al. 2008.

Gingival inflammation in both groups was almost the same 1-2 years after removal of the orthodontics brackets. However, although, the palatal pocket formation was more evident in moderate surgical, procedure, loss of attachment and interdental bone loss was greater after radical procedure. (Wisth et.al 1976).

Londehe and co-workers in 2015also reached a similar conclusion after closed surgical exposure of buccaly impacted canines.

Long term evaluation of periodontal health after closed surgical approach on 61 children by Rosmary Mak D'Amico et.al in 2003 showed no significant changes to periodontal health of canines however lateral incisors seems to have acquired deep pocket as the result. Fewer periodontal anomalies have been noticed after open window surgery.(Daniel Torres et al-2015).

In another study by Aldo Crescini and co-workers they compared surgically exposed canines (closed surgical method) with the normally erupted contralateral canines, the result showed no significant effect on periodontal health after closed surgical exposure.

Cervical root resorption has been noticed in canines exposed with open surgical approach as one of the drawbacks, wider surgical exposure by the surgeon has been blamed for the adverse result (Becker A. 2012).

Inadequate surgical exposure has its effect on eruption of surgically exposed canines according to Vincent G (2004). According to the author,

exposure of a palatally impacted canine during the mixed dentition to allow eruption without orthodontic interference would give better results in terms of periodontal health and root resorption of the canines and incisors.

Schmidt 2007 conducted a similar study however the verdict was slightly different to Vincent 2004 and they have concluded that the roots of impacted canines and lateral incisors were resorbed slightly compared to their contralateral, which had normal eruption and could be identified .But they too concluded open surgical approach has a better outcome.

Surgical time:

In 1997, both the closed and open surgical procedure have been reviewed and the biggest drawback of bracketing beside the longer anaesthetic time was technique sensitivity of the bracket attachments in the surgical environment ,which was inevitably directly related to surgeons experience.(Michael M. Pearson et. al. 1997)

A randomised clinical trial in 2008 demonstrated a significant reduction in time during open surgical approach.(Gharaibeh et.al 2008)

Recent research carried out in Delhi on different types of surgical exposure,the authors haveconcluded that the mean surgical time for open approach was shorter than the closed approach for buccaly impacted canines.

In a clinical trial conducted by Parkin NA et al (2012), no significant difference between the two surgical procedures in terms of surgical time or any patient assessed results were found. However the level of surgeon's experience was not accounted for,in this trial.

Post operation pain:

According to S. M. Londehe (2015), the pain perception after both surgical approaches was almost similar; however pain was reduced significantly quicker after closed technique.

Previous researches by Stella Chaushu et al, demonstrates a similar conclusion.

RESULT

They believed, after open surgical approach the recovery time of pain and analgesic consumption was longer andoral function was more impaired. The research was mostly considering immediate postoperative complications in terms of pain, oral function (ability to eat and enjoy food, mouth opening) and general activity measure.

Randomised control trial done by Gharaibeh et al 2008, illustrated the same result.

In a Retrospective study in china,post-operative swelling was the most reported sequel of canine exposure which depended on different factors including age, duration of surgery, and type of impaction The authors quote a prospective study which claimedaround 3% of patient who were treated using closed surgical technique reported severe pain three days post operatively and none in the subsequent days, however severe pain has been reported up to seven days after open exposure. (Anand K. et al 2014).

Wisth PJ et al (1976) believed treatment duration after radical and moderate surgical procedures was 18 and 22 month respectively.

CONCLUSION

According to Cochrane study 2008, 191researchesrelated to surgical exposure of palatally positioned canine have been found of which 163 were excluded. Out of remaining28, 15 was foreign and 6 needed translation.

There is a clearlack of substantial evidence to demonstrate a definitely different outcome, in choosing a particular surgical approach, open or close. Well conducted, multi -centre, randomized clinical trial needs to be conducted in this area, to reach a definitive conclusion enabling clinicians to make clear cut choices.

REFRENCE

[1] Becker, A. (2012) 'Orthodontic treatment of impacted teeth', -*Infinity*, .doi: 10.1002/9781118709641.

[2] Becker, A. (2012) 'Palatally impacted Canines', *Becker/Orthodontic Treatment of Impacted Teeth*, , pp. 110–172. doi: 10.1002/9781118709641.ch6.

[3] Bjerklin, K., Gleerup, A. and Kurol, J. (1995) 'Long-term treatment effects in children with ectopic eruption of the maxillary first permanent molars', *The European Journal of Orthodontics*, 17(4), pp. 293–304. doi: 10.1093/ejo/17.4.293.

[4] Chaushu, S., Becker, A., Zeltser, R., Branski, S., Vasker, N. and Chaushu, G. (2005) 'Patients' perception of recovery after exposure of impacted teeth: A comparison of closed- versus open-eruption techniques', *Journal of Oral and Maxillofacial Surgery*, 63(3), pp. 323–329. doi: 10.1016/j.joms.2004.11.007.

[5] Crescini, A., Nieri, M., Buti, J., Baccetti, T., Mauro, S. and Pini Prato, G.P. (2007) 'Short- and long-term periodontal evaluation of impacted canines treated with a closed surgical?Orthodontic approach', *Journal of Clinical Periodontology*, 34(3), pp. 232–242. doi: 10.1111/j.1600-051x.2006.01042.x.

[6] Crescini, A., Nieri, M., Buti, J., Baccetti, T., Mauro, S. and Pini Prato, G.P. (2007) 'Short- and long-term periodontal evaluation of impacted canines treated with a closed surgical? Orthodontic approach', *Journal of Clinical Periodontology*, 34(3), pp. 232–242. doi: 10.1111/j.1600-051x.2006.01042.x.

[7] Crescini, A., Nieri, M., Buti, J., Baccetti, T. and Pini Prato, G.P. (2007) 'Orthodontic and periodontal

outcomes of treated impacted Maxillary Canines', *The Angle Orthodontist*, 77(4), pp. 571–577. doi: 10.2319/080406-318.1.

[8] Ericson, S. and Kurol, J. (1987) 'Radiographic examination of ectopically erupting maxillary canines', *American Journal of Orthodontics and DentofacialOrthopedics*, 91(6), pp. 483–492.doi: 10.1016/0889-5406(87)90005-9.

[9] Ericson, S. and Kurol, J. (1988) 'Resorption of maxillary lateral incisors caused by ectopic eruption of the canines', *American Journal of Orthodontics and DentofacialOrthopedics*, 94(6), pp. 503–513. doi: 10.1016/0889-5406(88)90008-x.

[10] Gharaibeh, T.M. and Nimri, K.S. Al- (2008) 'Postoperative pain after surgical exposure of palatally impacted canines: Closed-eruption versus open-eruption, a prospective randomized study', *Oral Surgery, Oral Medicine, Oral Pathology, Oral Radiology, and Endodontology*, 106(3), pp. 339–342. doi: 10.1016/j.tripleo.2007.12.025.

[11] Harradine (1998) 'The orthodontic treatment of impacted teeth.By Adrian Becker.Published by Martin Dunitz Ltd, 1998, pp. 234.Price 65. ISBN 1 85317 328 2', *International Journal of Paediatric Dentistry*, 8(2), pp. 169–174. doi: 10.1046/j.1365-263x.1998.0078e.x.

[12] Jacoby, H. (1983) 'The etiology of maxillary canine impactions', *American Journal of Orthodontics*, 84(2), pp. 125–132.doi: 10.1016/0002-9416(83)90176-8.

[13] Kokich, V.G. (2004) 'Surgical and orthodontic management of impacted maxillary canines', *American Journal of Orthodontics and DentofacialOrthopedics*, 126(3), pp. 278–283. doi: 10.1016/j.ajodo.2004.06.009.

[14] Parkin, N.A., Deery, C., Smith, A.-M., Tinsley, D., Sandler, J., Benson, P.E., author Affiliations Professor, this, Honorary, author Affiliations Specialist, this and author Affiliations Consultant, this (2012) 'No difference in surgical outcomes between open and closed exposure of Palatally displaced Maxillary Canines', *Journal of Oral and Maxillofacial Surgery*, 70(9), pp. 2026–2034. doi: 10.1016/j.joms.2012.02.028.

[15] Pearson, M.H., Robinson, S.N., Reed, R., Birnie, D.J. and Zaki, G.A. (1997) 'Management of palatally impacted canines: The findings of a collaborative study', *The European Journal of Orthodontics*, 19(5), pp. 511–515. doi: 10.1093/ejo/19.5.511.

[16] Peck, S., Peck, L. and Kataja, M. (2002) 'Concomitant occurrence of canine malposition and tooth agenesis: Evidence of orofacial genetic fields', *American Journal of Orthodontics and Dentofacial Orthopedics*, 122(6), pp. 657–660. doi: 10.1067/mod.2002.129915.

[17] Peck, S., Peck, P. and Kataja, M. (1994) *The palatally displaced canine as a dental anomaly of genetic origin,*. Available at: The Angle Orthodontist, 64, (4), 250-256, 1994,doi = 10.1043/0003-3219(1994)064<0250:TPDCAA>2.0.CO;2 .

[18] Sajnani, A.K. and King, N.M. (2014) 'Complications associated with the occurrence and treatment of impacted maxillary canines', *Singapore Dental Journal*, 35, pp. 53–57. doi: 10.1016/j.sdj.2014.07.001.

[19] Schmidt, A.D. and Kokich, V.G. (2007) 'Periodontal response to early uncovering, autonomous eruption, and orthodontic alignment of palatally impacted maxillary canines', *American Journal of Orthodontics and Dentofacial Orthopedics*, 131(4), pp. 449–455. doi: 10.1016/j.ajodo.2006.04.028.

[20] Torres-Lagares, D., Hita-Iglesias, P., Azcárate-Velázquez, F., Garrido-Serrano, R., Ruiz-de-León-Hernández, G., Velazquez-Cayón, R. and Gutiérrez-Pérez, J.-L. (2015) 'What are the Histologic effects of surgical and orthodontic treatment on the Gingiva of Palatal impacted Canines?',*Journal of Oral and Maxillofacial Surgery*, 73(12), pp. 2273–2281. doi: 10.1016/j.joms.2015.07.002.

[21] Wisth, P.J., Norderval, K. and Bøe, O.E. (1976) 'Comparison of two surgical methods in combined surgical-orthodontic correction of impacted maxillary canines', *ActaO dontologica Scandinavica*, 34(1), pp. 53–57. doi: 10.3109/00016357609026558.

[22] Zasciurinskiene, E., Bjerklin, K., Smailiene, D., Sidlauskas, A. and Puisys, A. (2008) 'Initial vertical and horizontal position of Palatally impacted Maxillary canine and

effect on periodontal status following surgical-orthodontic treatment', *The Angle Orthodontist*, 78(2), pp. 275–280. doi: 10.2319/010907-8.1.

[23] londhe, Saxena, V., Kumar, P., londhe, S., Kotwal, A. and Datana, S. (2014) *Guided tooth eruption: Comparison of open and closed eruption techniques in labially impacted maxillary canines*. Available at: http://www.jdrr.org/article.asp?issn=2348-2915;year=2014;volume=1;issue=3;spage=148;epage=151;aulast=londhe (Accessed: 9 February 2016).