實證醫學---牙科應用
case conference

報告者：齒顎矯正科 CR鄭戎軒
指導醫師：周思婷 醫師

個案病歷摘要

- 25歲董小姐，來院主訴為全口牙齒排列不整，想讓牙齒排列整齊
- 患者上顎左上正中門牙較為外翻，其餘牙齒凌亂

個案病歷摘要

- PMH
  - Denied any systemic disease
  - Denied drug or food allergy
- PDH
  - Scaling, restoration, endodontic tx.

✓ Attitude to dental Tx.：nervous

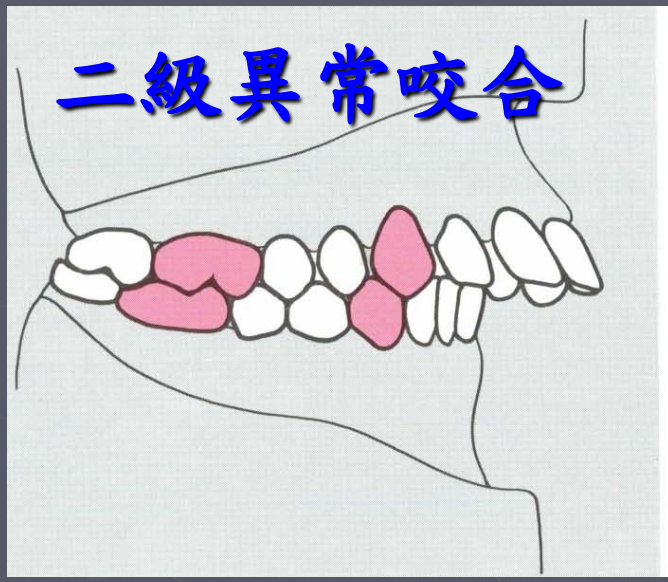
Diagnosis:
Dental Class II malocclusion

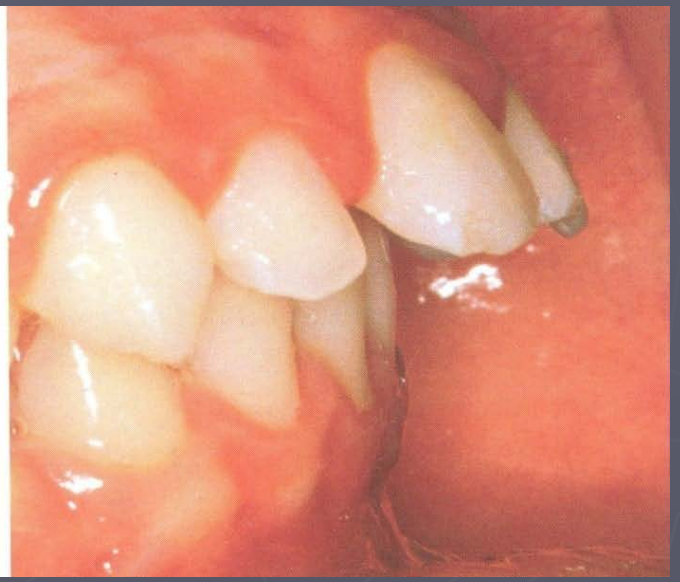


個案病歷摘要

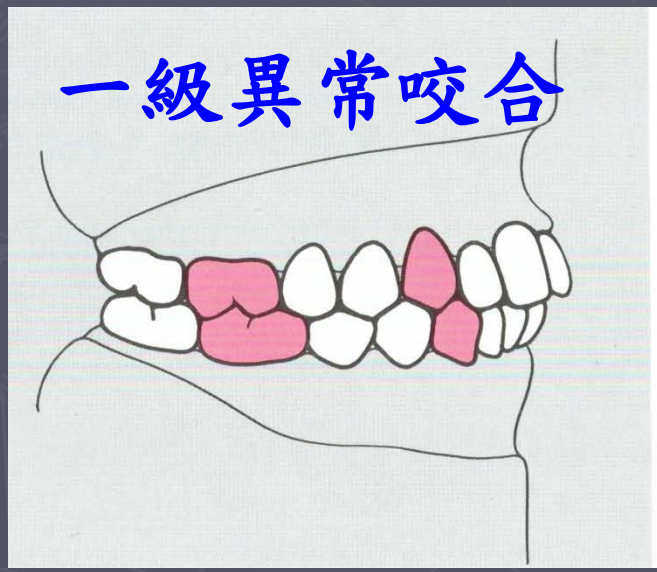
- 目前成人二級異常咬合常見的治療方式為：利用矯正骨釘後退第一大臼齒以達到安格氏一級異常咬合，同時也會考慮病人口內情況評估是否拔除第一小臼齒改善擁擠的齒列。
- 但患者表示，她平常對於口腔內的小手術都會非常緊張，希望能夠使用非侵入性的傳統矯正方式治療，而非時下較為流行的骨釘當成錨定的治療模式。
- **是否利用矯正骨釘改善成人二級異常咬合的問題？**

二級異常咬合





一級異常咬合



Background

- Anchorage –

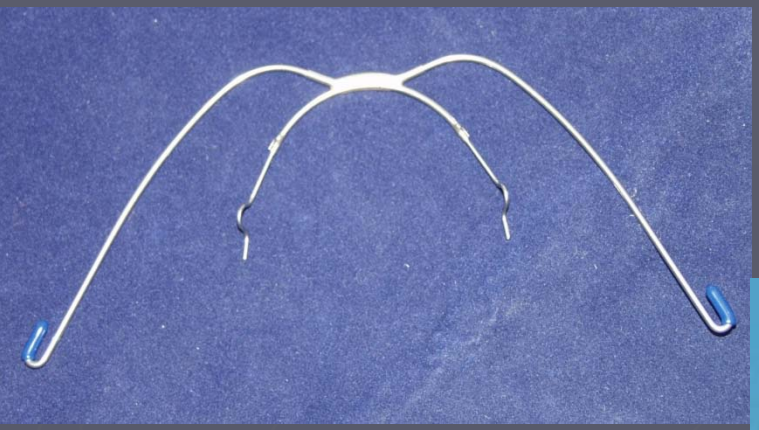
  the control of unwanted tooth movement.

- Conventionally

  Intraoral by teeth and the palate

  Extraoral by headgear

頭套 Headgear



Screw

1. Asking an answerable question

Asking

- **Does orthodontic tx use miniscrew as anchorage better than tranditional headgear as anchorage ?**

PICO

- Patient
  - Adult Class II malocclusion patient need to receive molar distalization for molar Class I malocclusion.
- Intervention
  - Orthodontic treatment with miniscrew
- Comparison
  - Orthodontic treatment with headgear
- Outcomes
  - ***Mesial movement of upper first permanent molar (radiograph)***
  - *Control of molar relation*
    - ***Upper molar moving distance***

2. 尋找文獻證據
(Tracking down the best evidence)

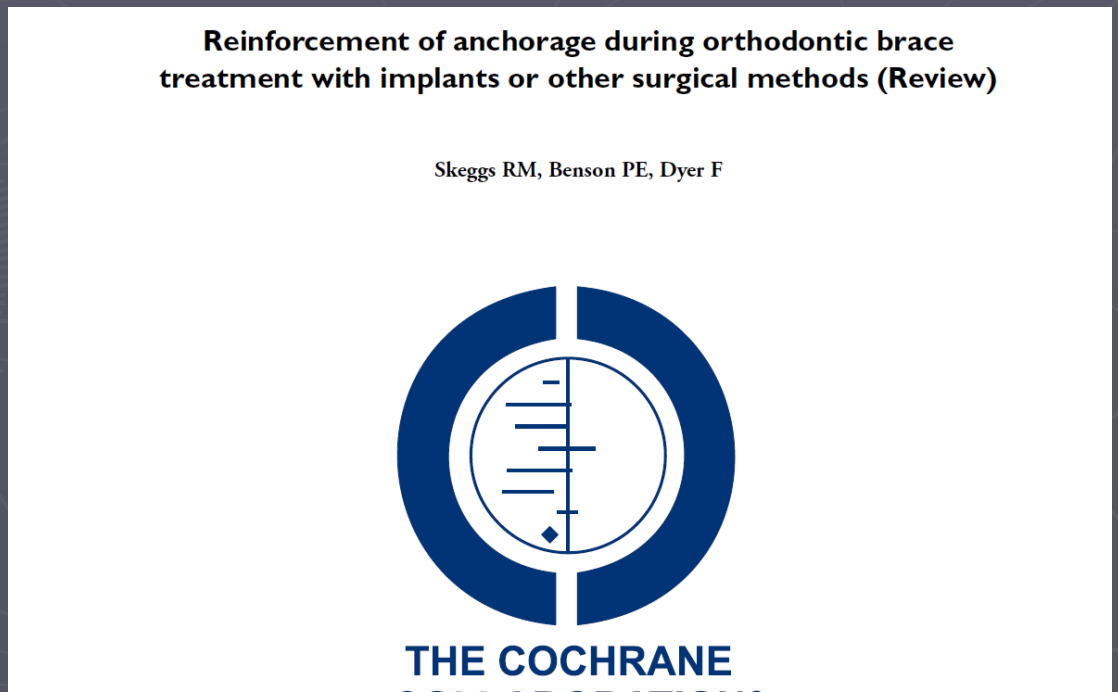
Tracking down the best evidence

* Database 的種類：
  - Pubmed：29 results
  - Medline via the Ovid and Embase databases:18
  - Cochrane Library :1 result
- Key words and search tactics:
  - (Orthodontics with miniscrews) and (orthodontics with headgear), molar movement, extraoral anchorage

- MeSH term: Dental Implantation, Endosseous; ToothMovement; Extraoral Traction Appliances

Tracking down the best evidence

- Reinforcement of anchorage during orthodontic brace treatment with implants or other surgical method
- *Skeggs RM, Benson PE, Dyer F. Cochrane Database of Systematic Reviews 2007*



Evidence Pyramid (證據金字塔)

3. 嚴格評讀文獻
(Critical appraisal)

Selection criteria

- Randomised or quasi-randomised clinical trials involving the use of surgically assisted means of anchorage reinforcement on orthodontic patients.

- Inclusion and exclusion criteria were applied when considering the studies to be included in this review

Objectives

- Evaluate the effectiveness of surgical methods for preventing unwanted tooth movement compared with conventional anchorage reinforcement techniques.

Search strategy

- Searched the databases for relevant trials:
  - Medline and PubMed
  - Cochrane Library
  - Medline via the Ovid and Embase databases
    - Date of last search was end of February 2006
    - Language limitations ~ No language restrictions
- Handsearching of journals was performed if this had not already been carried out as part of the Cochrane handsearching programme.

Types of studies

- **Types of participants**
  - Patients of any age undergoing orthodontic treatment with braces

- **Types of interventions**
  - Mid-palatal implants, onplants, miniscrews, spider screws, titanium plates were considered under the term

Characteristics of included studies *[ordered by study ID]*

Benson

Methods	RCT conducted in a UK teaching hospital and a district general hospital. Patients randomly allocated to 1 of 2 parallel groups.
Participants	51 patients; results given for 47: 3 participants (2 in implant group and 1 in headgear group) decided not to go ahead with treatment after they had been allocated to groups. 1 in the headgear group was excluded from the analysis because no T2 (end of anchorage reinforcement) cephalometry was taken. Age 12-39. Class II Division 1 malocclusions with 'absolute anchorage' requirements
Interventions	Headgear versus mid-palatal implant. Treatment times: 2.23 years (SD 0.62) headgear group; 2.15 years (SD 0.59) mid-palatal implant group
Outcomes	Assessment of anchorage loss by radiographic measurement of mesial movement of molar and incisal reference points between T1 (treatment start) and T2 (end of anchorage reinforcement)
Notes	Data extraction and quality assessment by Richard Skeggs and Fiona Dyer

Risk of bias

Item	Authors' judgement	Description
Allocation concealment?	Yes	A - Adequate

RCT = randomised controlled trial
SD = standard deviation

Characteristics of excluded studies *[ordered by study ID]*

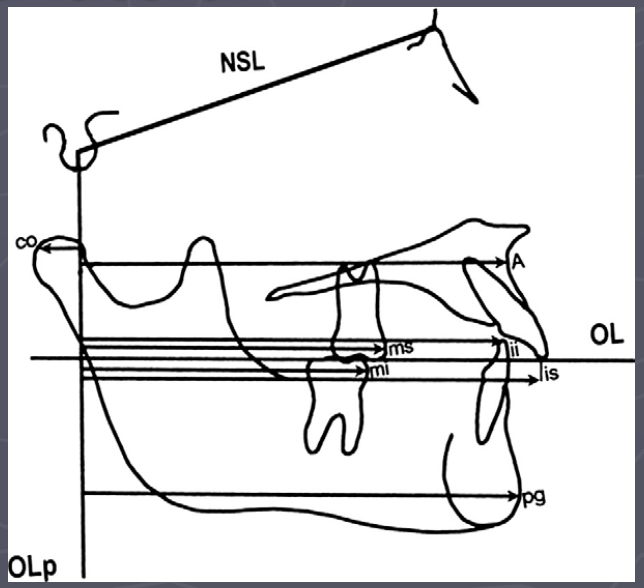
Study	Reason for exclusion
Bernhart 2001	Not an RCT. No appropriate control group. Vague inclusion and exclusion criteria.
Cheng 2004	Not an RCT. Randomisation technique not described. No appropriate control group. No clear inclusion and exclusion criteria. Author contacted for further details but no reply.

Favero 2002	Literature review. There is no clear question, no description of searches or methodology. No evidence of a systematic protocol.
Freudenthaler 2001	Not an RCT. No appropriate control group. Some inclusion but no exclusion criteria.
Higuchi 1991	Prospective observational study. Not an RCT. No appropriate control.
Odman 1994	Not an RCT. Study aims not clear. No control group. Some inclusion but no exclusion criteria.
Roberts 1996	Case series. No control group. Aims not clear. No inclusion or exclusion criteria.
Sugawara 2002	Case series. Probably retrospective. Authors contacted for information but no reply. Study aim not clear. No inclusion or exclusion criteria.
Trisi 2002	Not an RCT.
Wehrbein 1999	Prospective observational study. No appropriate control group.

RCT = randomised controlled trial

Types of outcome measures

-- Anchorage loss was measured in dental terms by residual overjet at the end of treatment and also mesial movement of the upper first permanent molar teeth, as measured on a lateral cephalometric radiograph.



Data collection and analysis

- Data were entered into RevMan with planned analysis of mean differences (MD) and 95% confidence intervals (CI) for continuous outcomes and risk ratios (RR) and 95% CI for dichotomous outcomes.

- Pooling of data and meta-analysis were not performed due to an insufficient number of similar studies.

DATA AND ANALYSES

Comparison 1. Anchorage loss

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mesial movement of the upper first permanent molar (radiograph)	1	47	Mean Difference (IV, Fixed, 95% CI)	-1.5 [-3.23, 0.23]

Main results~

Analysis 1.1. Comparison 1 Anchorage loss, Outcome 1 Mesial movement of the upper first permanent molar (radiograph).

Review: Reinforcement of anchorage during orthodontic brace treatment with implants or other surgical methods

Comparison: 1 Anchorage loss

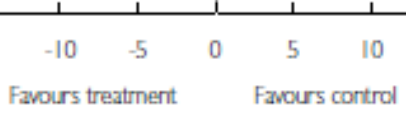
Outcome: 1 Mesial movement of the upper first permanent molar (radiograph)

Study or subgroup	Mid-palatal implant N	Mean(SD)	Headgear N	Mean(SD)	Mean Difference IV,Fixed,95% CI	Weight	Mean Difference IV,Fixed,95% CI
Benson	23	1.5 (2.6)	24	3 (3.4)		100.0 %	-1.50 [-3.23, 0.23]
Total (95% CI)	**23**		**24**			**100.0 %**	**-1.50 [-3.23, 0.23]**

Heterogeneity: not applicable

Test for overall effect: Z = 1.70 (P = 0.089)

Test for subgroup differences: Not applicable



NO statistically significant difference

Main results~

- The review authors were only able to find one study assessing the use of surgical anchorage reinforcement systems.

- 51 patients in two centres.
- Patients were randomly allocated to receive either headgear or a mid-palatal osseointegrated implant.

- T1 (treatment start) and T2 (end of anchorage reinforcement).

Main results~

- implant group was 1.5 mm (SD 2.6; 95% CI 0.4 to 2.7)
- headgear group 3.0 mm (SD 3.4; 95% CI 1.6 to 4.5).

- The trial was designed to test a clinically significant difference of 2 mm, so the result was not statistically significan

Author's conclusions

- **Implications for practice**
  - There is evidence that mid-palatal implants are an acceptable alternative to headgear reinforced anchorage in orthodontic patients.
  - However, at present there are insufficient research data on which to base much of our clinical practice.

Author's conclusions

- **Implications for research**
  - Appropriate outcomes from such research should include anchorage loss, failure rates, financial costs and assessment of discomfort and related quality of life issues.

Critical Appraisal of Systematic Review
“系統性回顧”的評析

- -Are the results of the review valid (效度如何)?
- – What question did the systematic review addressed (回答什麼問題)?
- – Is it unlikely that important, relevant studies were missed (沒有遺漏重要的文獻)?
- – Were the criteria used to select articles for inclusion appropriate
- (選擇文獻的準則適當)?
- – Were the included studies sufficiently valid for the type of
- question asked (選擇的文獻有效回答所問的問題)?
- – Were the results similar from study to study (各研究的結果相似)?
- • What were the results (結果爲何)?
- – How are the results presented (結果如何呈現)?

Appraisal ~ Systematic Review

- **What question (PICO) did the systematic review address?想要回答什麼問題？**

最理想狀況為何？	何處找到相關訊息？
應清楚闡明文章想要回答的問題，暴露因子(包括治療、檢驗等)與結果的因果關係簡單明瞭	題目、摘要或前言的末段應清楚描述所關心的問題。

This paper: Yes ■ **No** **Unclear**
Comment:

Appraisal ~ Systematic Review

- **Is it unlikely that important, relevant studies were missed？有沒有遺漏重要的文獻？**

最理想狀況為何？	何處找到相關訊息？
資料搜尋是否完整，包含 -- 重要的資料庫如Medline, Cochrane, EMBASE等 -- 相關研究的參考文獻 -- 向專家請教，特別是尚未刊載的研究 -- **不只限於英文資料** -- 搜尋策略包括MESH term及text words	“研究方法”詳細描述搜尋字彙與策略 “研究結果”詳列回顧的題目、摘要、全文數目，排除的文章及排除理由，並以圖表或流程圖呈現

This paper: Yes ■ No **Unclear**

Comment:

Appraisal ~ Systematic Review

- **Were the criteria used to select articles for inclusion appropriate選擇文獻的準則適當?**

最理想狀況為何？	何處找到相關訊息？
事先清楚界定“收入”及“排除”文章的準則準則的描述應包括病人群的特性、介入治療的方法或暴露因子、有興趣的研究結果研究的類型及研究設計	“研究方法”詳細描述“收入”及“排除”文章的準則，通常亦包含研究的類型

This paper: **Yes** ■ **No** **Unclear**

Comment:

Appraisal ~ Systematic Review

- **Were the included studies sufficiently valid for the type of question asked** 選擇的文獻有效回答所問的問題?

最理想狀況為何？	何處找到相關訊息？
應描述所回顧的每篇文章研究的品質研究品質的判定準則依不同臨床問題而事先擬定的，如隨機分配、雙盲、追蹤的完整度等	“研究方法”應描述品質的評估及所使用的準則“研究結果”應說明各研究的品質

This paper: Yes ■ No Unclear

Comment:

Appraisal ~ Systematic Review

- **Were the results similar from study to study** 各研究的結果相似?

最理想狀況為何？	何處找到相關訊息？
最理想的狀況是各研究的結論一致或差異不大 如果各研究的結果有差異，作者以統計的方法檢驗是否達到有統計意義的差別 探討各研究結論差異的原因	“研究結果”應說明各研究的結果是否有差異，並討論可能的原因

This paper: **Yes** ■ **No** **Unclear**
Comment:

4. 應用於病人身上

(Integrating the appraisal with clinical expertise & patients' preference)

Application

- 在研究上，我們運用EBM的模式去確定利用骨釘當成錨定矯正治療方式和利用傳統頭套當成錨定的臼齒移動差別並**沒有顯著差異**，差別度在於病人的配合程度。這樣可以讓牙醫師與病人的治療模式上有更多選擇及方便性。

5,自我評估
Evaluation our performance

在「提出臨床問題」方面的自我評估

- 我提出的問題是否具有臨床重要性？我是否明確的陳述了我的問題？

  –我的foreground question 是否可以清楚的寫成PICO？

  –我是否清楚的知道自己問題的定位？（亦即可以定位自己的問題是屬於診斷上的、治療上的、預後上的或流行病學上的），並據以提出問題？
- 對於無法立刻回答的問題，我是否有任何方式將問題紀錄起來以備將來有空時再找答案？

在「搜尋最佳證據」方面的自我評估

- 我是否已盡全力搜尋？
- 我是否知道我的問題的最佳證據來源？
- 我是否從大量的資料庫來搜尋答案？
- 我工作環境的軟硬體設備是否能支援我在遇到問題時進行立即的搜尋？
- 我是否在搜尋上愈來愈熟練了？
- 我會使用「斷字」、布林邏輯、同義詞、MeSH term，限制（limiters)等方法來搜尋？
- 我的搜尋比起圖書館人員或其他對於提供病人最新最好醫療有熱情的同事如何？

關於「應用到病人身上」的自我評估

- 我是否將搜尋到的最佳證據應用到我的臨床工作中？
- 我是否能將搜尋到的結論用病人聽得懂的方式解釋給病人聽？
- 當搜尋到的最佳證據與實際臨床作為不同時，我如何解釋？

改變「醫療行為」的自我評估

- 當最佳證據顯示目前臨床策略需改變時，我是否遭遇任何阻止改變的阻力？
- 我是否因此搜尋結果而改變了原來的治療策略？做了那些改變？

效率評估

- 這篇報告，我總共花了多少時間？（10小時）
- 我是否覺得這個進行實證醫學的過程是值得的？
- 我還有那些問題或建議？

Thanks for your attention!