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TRAUMA/BRIEF RESEARCH REPORT

Extension Test and Ossal Point Tenderness Cannot Accurately Exclude Significant Injury in Acute Elbow Trauma

Kim E. Jie, MD, PhD; Lisette F. van Dam, MD; Thijs F. Verhagen, MD; Eric R. Hammacher, MD, PhD

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Present: PGY 郭周斌

Supervisor: VS 侯勝文

背景

- 肘部損傷，2-3%
- 臨床有意義的骨折，30-40%
- Elbow extension test
  - 6.7%→非移位性骨折
  - 0.3%→手術
- Extension test+ ossal tender point+ bruising→100% sensitivity
- X光的角色？診斷上的必要性？

研究目的

- 探討在急性肘部損傷中有意義的臨床症狀
- 評估/預測是否需要進一步做影像檢查
- 減少不必要的浪費及時間等待

方法

- Prospective observational study
- 2 ED 荷蘭, 630 patients
- 先止痛
- Elbow extension test
- Tender point
  - Olecranon/epicondyles/radial head
- 1st endpoint
  - X-ray finding; AP + lateral
- 2nd endpoint
  - Radiologist and trauma surgeon; interobserver variability

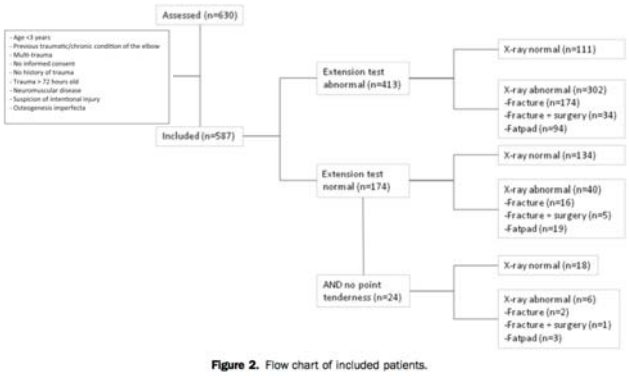
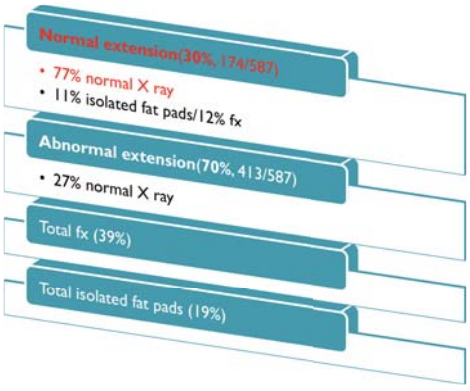
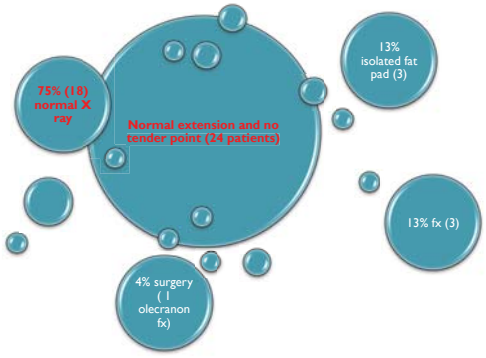


Figure 2. Flow chart of included patients.

結果



結果



結果

Table 1. Diagnostic values of physical elbow examination to predict an abnormal radiograph result.

Patient Group	Test	Fracture or Fat Pad on Radiograph: Sensitivity, % [95% CI] (Test+/Radiograph+)	Fracture or Fat Pad on Radiograph: Specificity, % [95% CI] (Test−/Radiograph−)	Fracture on Radiograph: Sensitivity, % [95% CI] (Test+/Radiograph+)	Fracture on Radiograph: Specificity, % [95% CI] (Test−/Radiograph−)
All	Extension (n=587)	88 [85–91] (302/342)	55 [48–61] (134/245)	91 [86–94] (208/229)	43 [38–48] (153/358)
	Point tenderness (n=474)	87 [83–91] (240/275)	14 [10–20] (23/162)	92 [87–95] (173/188)	17 [13–23] (43/249)
	Extension and point tenderness (n=437)	98 [95–99] (269/275)	11 [7–17] (18/162)	98 [95–100] (185/188)	8 [6–13] (21/249)
Adults (≥16 y)	Extension (n=354)	91 [86–94] (200/220)	59 [51–67] (79/134)	94 [89–96] (158/169)	48 [41–55] (88/185)
	Point tenderness (n=267)	89 [84–93] (161/180)	18 [12–26] (16/87)	92 [86–95] (129/141)	18 [13–26] (23/126)
	Extension and point tenderness (n=267)	98 [94–99] (176/180)	14 [8–23] (12/87)	99 [95–100] (139/141)	11 [7–18] (14/126)
Children (<16 y)	Extension (n=233)	84 [76–89] (102/122)	50 [40–59] (55/111)	83 [72–91] (50/60)	38 [31–45] (65/173)
	Point tenderness (n=170)	83 [74–89] (79/95)	9 [5–18] (7/75)	94 [83–98] (44/47)	16 [11–24] (20/123)
	Extension and point tenderness (n=170)	98 [93–99] (93/95)	8 [4–16] (6/75)	98 [89–100] (46/47)	6 [3–11] (7/123)

CI, Confidence interval.

Table 2. Interobserver analyses (n=252).

	κ Value	Percentage of Agreement Between Observers
Extension test	0.64	86
Palpation radial head	0.63	81
Palpation olecranon	0.66	85
Palpation lateral epicondyle	0.59	81
Palpation medial epicondyle	0.55	79

結論

- Extension test 正常的病人，影像學上大多也是正常的(77%)
- 然而，extension test，甚至加上tender point的評估並無法有效地排除肘部損傷中significant injury(fx or fat pads)
  - extension test
    - Sensitivity 88%→12% missed fx
  - Extension test and tender point
    - Specificity 11%→89% over-diagnosis

結論

- Interobserver差異度大
- 不建議以這兩種評估方式來決定是否需要做後續的影像學檢查

討論

- Limitation
  - Staff training
  - Loss follow up(22%)
  - Trauma mechanism
- First to evaluate interobserver variability; training yield better agreement?
- Comparison
  - Normal extension definition
  - Pain control→ before or after
  - Lower diagnostic value→ add "bruising"
  - Missed fx rate (12 v.s 1.6%)→all received image survey or not, nondislocated fx was not diagnosed

EMERGENCY MEDICAL SERVICES/ORIGINAL RESEARCH

Effect of Out-of-Hospital Noninvasive Positive-Pressure Support Ventilation in Adult Patients With Severe Respiratory Distress: A Systematic Review and Meta-analysis

Sameer Mal, MD, FRCPC*; Shelley McLeod, MSc; Alla Iansavichene, BSc, MLIS; Adam Dukelow, MD, FRCPC; Michael Lewell, MD, FRCPC

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背景

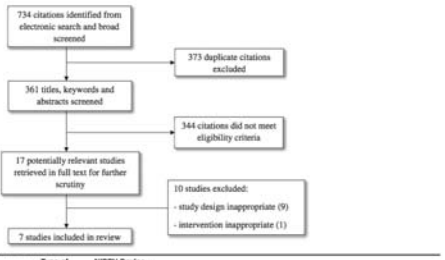
- 呼吸困難/窘迫
  - 急性心因性肺水腫
  - COPD急性惡化/氣喘急性惡化
  - 肺炎
- Out of hospital治療
  - O2/diuretics/inotropic
- Inhospital治療
  - 非侵襲性正壓呼吸器(NIPPV): CPAP/BiPAP
- 住院死亡率/插管率

研究目的

- 到院前使用非侵襲性正壓呼吸器，和一般所謂的標準治療相比較，是否能減少急性呼吸窘迫/困難病人的住院死亡率及後續需要插管的機率。

方法

- 資料庫：MEDLINE/EMBASE/Cochrane
- Inclusion
  - Randomize control trials/systemic review
  - English / >16y/o
- Meta-analysis
  - 1st objective:住院死亡率
  - 2nd objectives:
    - 住院天數（含加護病房)/插管率/使用正壓呼吸器之併發症
- Risk ratios/Number need to treat



Trial	Type of Disease	NIPPV Device, Dose, cm H_2O	Standard Care	Outcomes	STD n	TX n
Plaisance (2007) France[16]	ACPE	CPAP, 7.5	Diuretics, NTG, CCB, ionotropes, O_2	**DCS, ABG**, ETT, death	61	63
Frontin (2011) France[17]	ACPE	CPAP, 10	Diuretics, nitrates, O_2	**Vitals**, ETT, death, ICU LOS, hospital LOS	62	60
Schmidbauer (2011) Germany[17]	AECOPD	CPAP, unclear	O_2	DCS, ETT, ICU LOS, RR, O_2	18	18
Thompson (2008) Canada[18]	Severe resp distress	CPAP, 10	Diuretics, NTG, morphine, bronchodilators, O_2	**ETT**, death, ICU LOS, hospital LOS	35	36
Weitz (2007) Germany[19]	ACPE	BiPAP, 12.5/5	Diuretics, NTG, morphine, O_2	**O_2 sat**	13	10
Ducros (2011) France[14]	ACPE	CPAP, 7.5–10	Diuretics, nitrates, ionotropes, O_2	**Death, ETT**, ICU LOS, med doses, BNP/TnI	100	107
Roessler (2012) Germany[20]	ACPE, AECOPD, pneumonia	CPAP, 5–20	Bronchodilators, dexamethasone, opiates, Lasix, O_2	**Effectiveness of treatment**, 90-day survival, 28-day survival, SpO_2, RR, ICU LOS, hospital LOS	25	24

STD, standard; TX, treatment; ACPE, acute cardiogenic pulmonary edema; CPAP, continuous positive airway pressure; NTG, nitroglycerin; CCB, calcium channel blocker; DCS, dyspnea clinical score; ABG, arterial blood gas; ETT, endotracheal intubation; LOS, length of stay; AECOPD, acute exacerbation of chronic obstructive pulmonary disease; ICU, intensive care unit; RR, respiratory rate; BiPAP, bi-level positive airway pressure; BNP, brain natriuretic peptide; TnI, Troponin-I; SpO_2, blood oxygen saturation.
Bold indicates primary outcome.

Table 3. Risk of bias summary for included trials.

Trial	Random Sequence Generation	Allocation Concealment	Blinding of Pts/Personnel	Blinding of Outcome Assessment	Lost to Follow-up (%)	Free of Selective Outcome Reporting
Plaisance (2007)[16]	Yes	Yes	No	No	0	Yes
Frontin (2011)[17]	Yes	Yes	No	No	0	Yes
Schmidbauer (2011)[17]	Yes	Yes	No	No	0	Unclear
Thompson (2008)[18]	Yes	Yes	No	No	2.8	Yes
Weitz (2007)[19]	Unclear	Unclear	No	No	0	Unclear
Ducros (2011)[14]	Unclear	Unclear	No	No	2.9	Yes
Roessler (2012)[20]	Yes	Yes	No	No	3.4	Yes
Summary score	Low risk of bias	Low risk of bias	High risk of bias	High risk of bias	Low risk of bias	Low risk of bias

結果

- 到院前使用NIPPV可以減少住院死亡率
  - RR 0.58, NNT 18

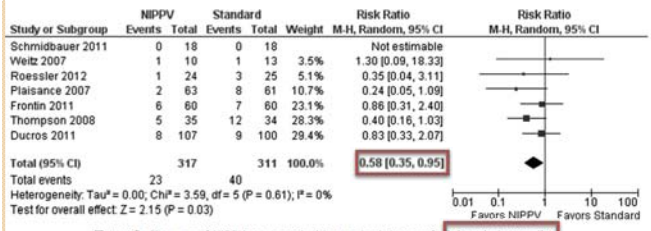
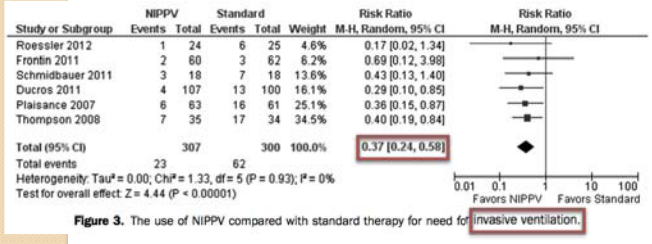


Figure 2. The use of NIPPV compared with standard therapy for inhospital mortality.

結果

- 到院前使用NIPPV可以減少侵襲性呼吸器使用率
  - RR 0.37, NNT 8



Study or Subgroup	NIPPV Events	NIPPV Total	Standard Events	Standard Total	Weight	Risk Ratio M-H, Random, 95% CI
Roessler 2012	1	24	6	25	4.6%	0.17 [0.02, 1.34]
Frontin 2011	2	60	3	62	6.2%	0.69 [0.12, 3.98]
Schmidbauer 2011	3	18	7	18	13.6%	0.43 [0.13, 1.40]
Ducros 2011	4	107	13	100	16.1%	0.29 [0.10, 0.85]
Plaisance 2007	6	63	16	61	25.1%	0.36 [0.15, 0.87]
Thompson 2008	7	35	17	34	34.5%	0.40 [0.19, 0.84]
Total (95% CI)		307		300	100.0%	0.37 [0.24, 0.58]
Total events	23		62			

Heterogeneity: Tau² = 0.00; Chi² = 1.33, df = 5 (P = 0.93); I² = 0%
Test for overall effect: Z = 4.44 (P < 0.00001)

Risk Ratio M-H, Random, 95% CI
0.01 0.1 1 10 100
Favors NIPPV Favors Standard

Figure 3. The use of NIPPV compared with standard therapy for need for invasive ventilation.

結果

- 加護病房/住院天數因為insufficient data而無法pooling，故無RR及NNT統計數據。

Table 2. Hospital and ICU LOS as reported by included trials.

Trial	Hospital LOS: Standard Care	Hospital LOS: NIPPV	Hospital LOS: *P* Value	ICU LOS: Standard Care	ICU LOS: NIPPV	ICU LOS: *P* Value
Frontin (2011)[15]	Median 6 days (IQR 2,9)	Median 6 days (IQR 3, 8)	.50	Median 8.2 h (IQR 5.3, 14.5)	Median 8 h (IQR 5.2, 12.5)	.27
Schmidbauer (2011)[17]	Median 7.7 days (IQR 3.1, 14.6)	Median 2.5 days (IQR 1.0, 5.5)	.02	Median 13 h (IQR 7, 20)	Median 8 h (IQR 3, 14)	.16
Thompson (2008)[18]	Median 9 days	Median 7 days	nr	Median 3 days	Median 6.5 days	nr
Weitz (2007)[19]	Mean (SD) 12.5 (1.8) days	Mean (SD) 8.2 (2.3) days	nr	Mean (SD) 2.3 (0.6) days	Mean (SD) 1.7 (0.5) days	nr
Ducros (2011)[14]	nr	nr	nr	Median 2 days (IQR 1, 3)	Median 2 days (IQR 1, 3)	.67
Roessler (2012)[20]	Mean (SD) 17.4 (18) days	Mean (SD) 13.9 (14.4) days	.50	Mean (SD) 3.7 (6.4) days	Mean (SD) 1.3 (2.6) days	.03

IQR, interquartile range; nr, not reported.

結果

- 有五篇論文提及使用NIPPV併發症相關數據
- 3篇：No complication
- 2篇：1% (3 patients) emesis

結論

- 對於病因未名，嚴重呼吸窘迫（undifferentiated severe respiratory distress) 的成年病患（大於16歲），到院前使用NIPPV是有效的治療方式（effective therapy)。

Table 4. Summary of findings.*

Outcomes	No. of Participants (Studies)	Quality of the Evidence (GRADE)	NNT (95% CI)	Relative Effect (95% CI)	Anticipated Absolute Effects: Risk With Standard Therapy	Anticipated Absolute Effects: Risk Difference With NIPPV (95% CI)
Inhospital mortality	628 (7)	⊕⊕⊕⊖ Moderate† because of inconsistency	18 (9.7-109.2)	RR 0.58 (0.35-0.95)	129/1,000	54 fewer per 1,000 (from 6 fewer to 84 fewer)
Intubation	607 (6)	⊕⊕⊕⊕ High	8 (5.4-12.9)	RR 0.37 (0.24-0.58)	207/1,000	130 fewer per 1,000 (from 87 fewer to 157 fewer)

*The basis for the assumed risk (eg, the median control group risk across studies) is provided in footnotes. The corresponding risk (and its 95% CI) is based on the assumed risk in the comparison group and the relative effect of the intervention (and its 95% CI). GRADE Working Group grades of evidence: High quality: Further research is very unlikely to change our confidence in the estimate of effect. Moderate quality: Further research is likely to have an important influence on our confidence in the estimate of effect and may change the estimate. Low quality: Further research is very likely to have an important influence on our confidence in the estimate of effect and is likely to change the estimate. Very low quality: We are very uncertain about the estimate.
†Although the CIs overlapped, 1 of 7 (Weitz) favored standard therapy.

討論

- Limitation:
  - Enrolled 條件：hypoxic respiratory failure(SpO2<90%) and tachypnea
    - **Pneumonia/ACS?**
  - Standard therapy
    - Physician (歐洲）v.s paramedic(加拿大）
  - NIPPV使用一致性
    - External pressure regulator/turbulent flow valve/ portable ventilator
    - Dose: CPAP 5~20 cmH2O; BiPAP:12.5/5 cmH2O
    - Length: 30-60 min

討論

- 禁忌症
  - 嚴重氣喘惡化
    - barotrauma, benefit未知
    - 1 trial 10 patients; no report of pneumothx or worsening dyspnea
  - 肺炎