

Background/Objective

- Chin position plays a critical role in facial aesthetics and balance.
- Common surgical options:
 - Alloplastic chin augmentation**
 - Osseous genioplasty** (± orthognathic surgery)
- Both approaches have distinct complication profiles.
- Clinical gap:** Limited large-scale comparative data to guide procedure selection.

Hypothesis: We hypothesized that osseous genioplasty results in more complications than alloplastic chin augmentations.

Methods

- Retrospective cohort study using **TriNetX database (2004–2024)**
- Total patients: 12,505**

Outcomes

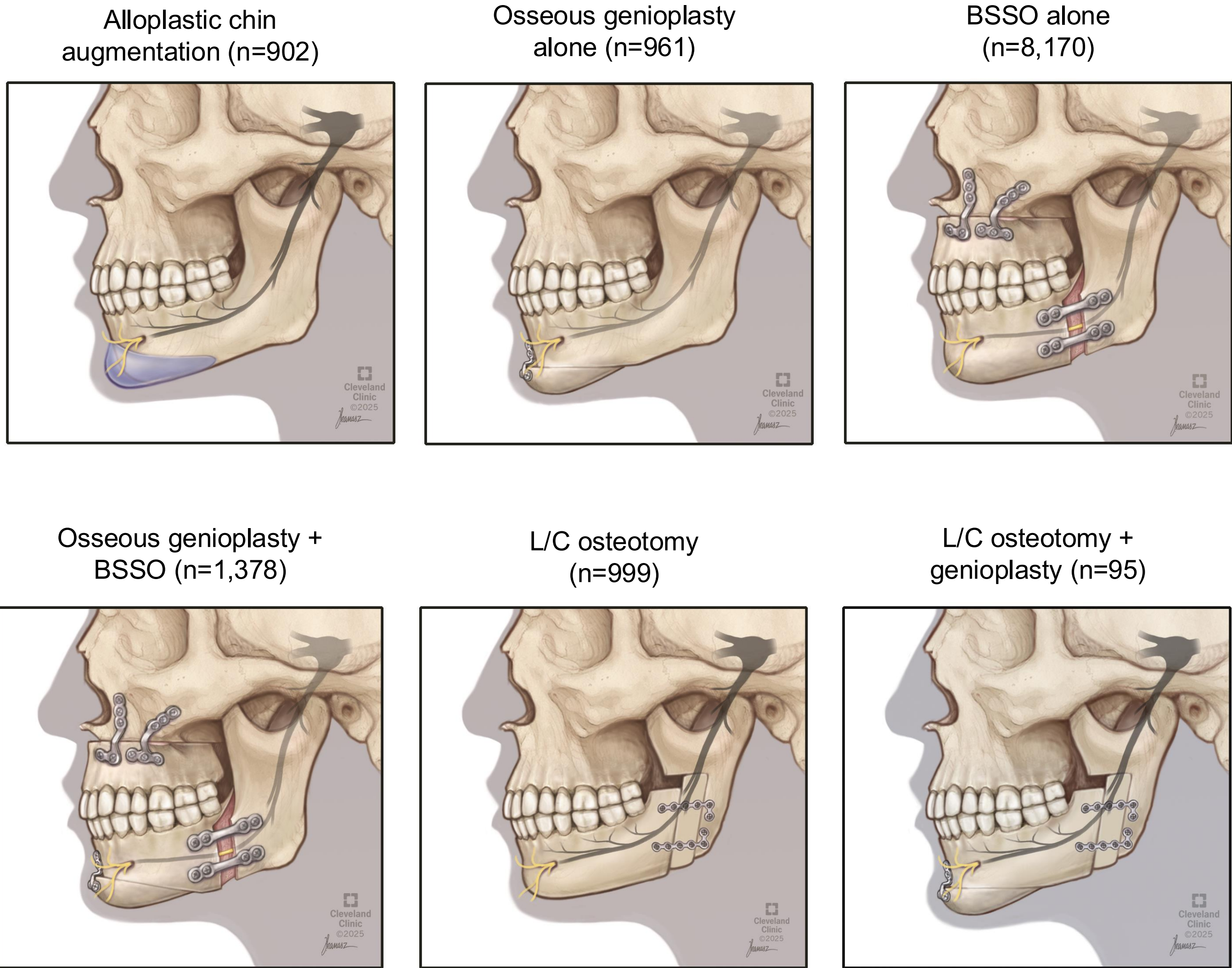
- Primary:** Overall surgical complications, including nerve injury, sensory changes, hardware/implant complications, wound issues, bleeding, fracture, malunion/nonunion, and DVT/PE.

- Secondary outcomes:** Reoperations, including repeat BSSO, genioplasty, chin implant, and hardware/implant removal.

- Major Complications: Complications requiring surgery
- Minor Complications: Complications managed non-surgically

Analysis

- Propensity score matching
- Significance: $p < 0.05$



Outcomes

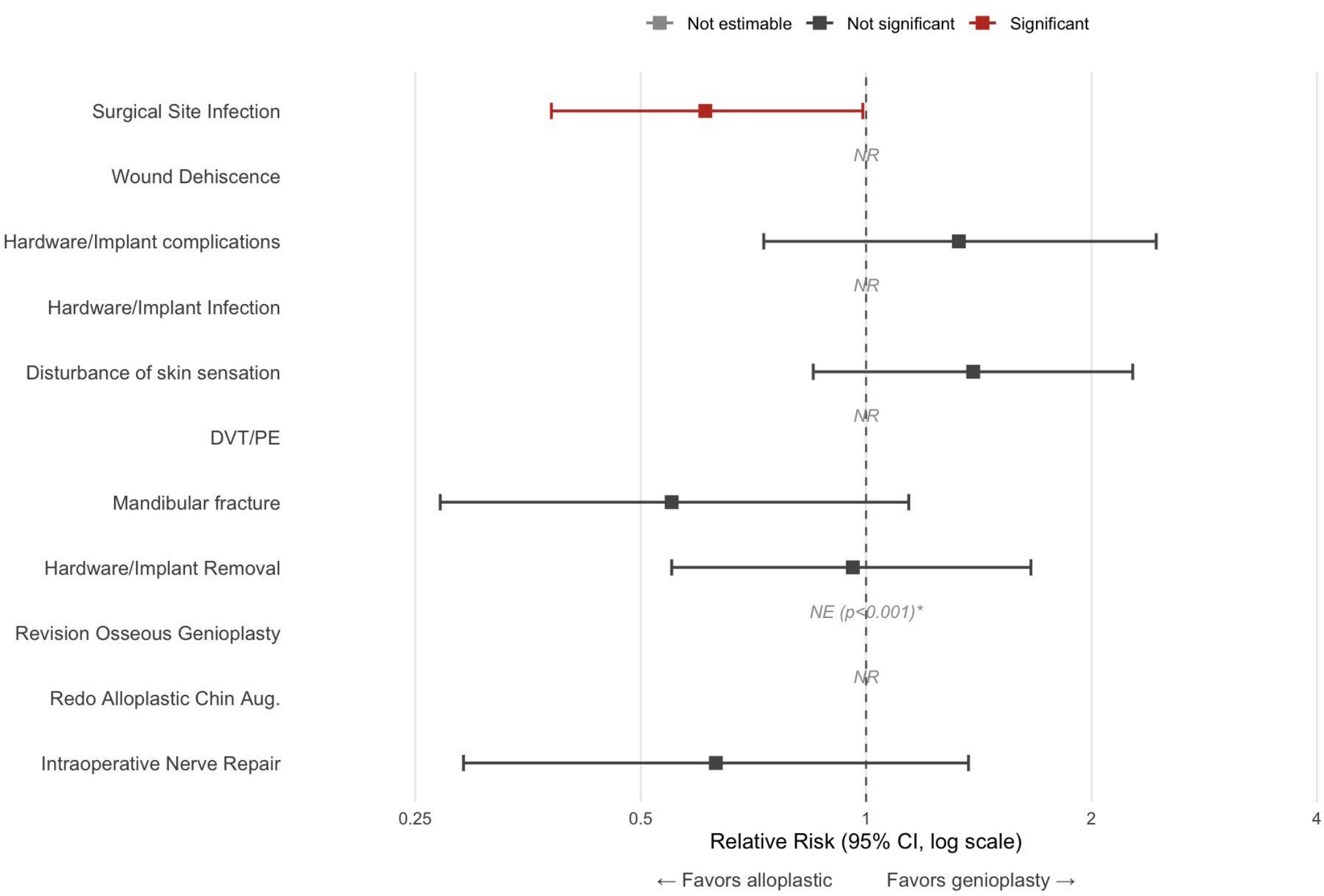
	Alloplastic Chin Augmentation (n=776)	Osseous Genioplasty alone (n=776)	p-value	Osseous Genioplasty with BSSO (1431)	BSSO alone (1431)	p-value
All Complications	7.47%	10.95%	0.02	21.80%	22.60%	0.62
Minor Complications	3.35%	4.90%	0.16	4.54%	5.38%	0.34
Major Complications	4.12%	6.06%	0.11	17.26%	17.26%	1.00

Complications and Secondary Procedures by Surgical Group

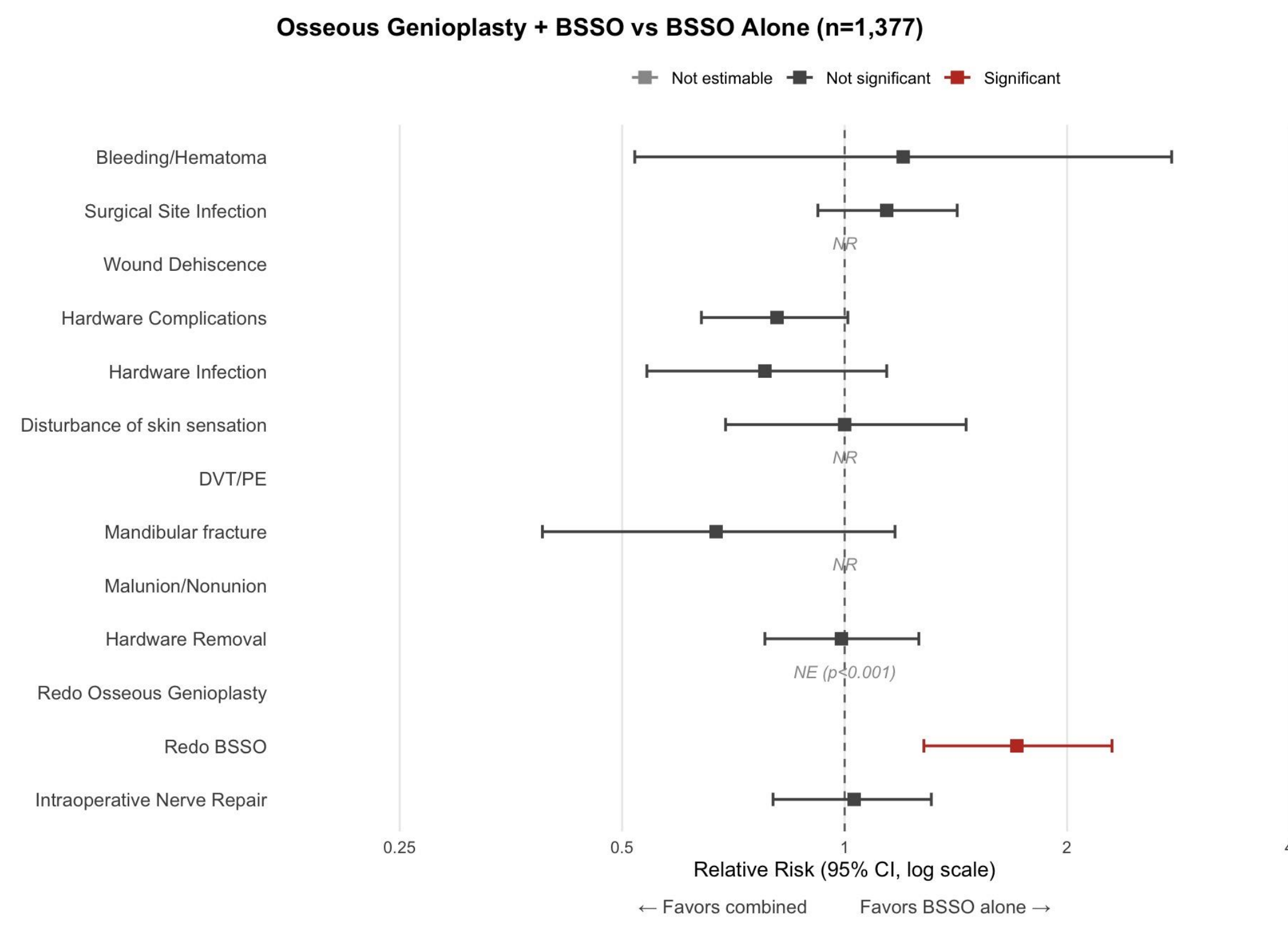
Grey cells = not applicable (NA); 's' = censored at small counts

	Alloplastic Chin Aug. (n=902)	Osseous Genioplasty (n=961)	Genioplasty + BSSO (n=1,378)	BSSO alone (n=8,170)	L/C Osteotomy alone (n=999)
Sensory Changes	4.90%	3.50%	3.92%	3.87%	4.81%
Hardware/Implant complications	3.33%	3.39%	8.40%	9.70%	11.40%
Surgical Site Infection	2.50%	4.02%	3.19%	4.70%	6.81%
Mandibular fracture	≤1.1%	1.52%	1.38%	3.09%	6.20%
Hardware/Implant Infection	≤1.1%	1.38%	3.27%	4.29%	4.30%
Bleeding/Hematoma	≤1.1%	≤1.04%	≤0.73%	0.70%	≤1%
Wound Dehiscence	≤1.1%	≤1.04%	≤0.73%	1.70%	1.40%
DVT/PE	≤1.1%	≤1.04%	0%	0.22%	≤1%
Malunion/Nonunion	NA	≤1.04%	≤0.73%	0.77%	1.90%
Repeat Alloplastic Chin Augmentation	3.50%	NA	NA	NA	NA
Hardware/Implant Removal	2.92%	5.08%	8.57%	9.19%	33.43%
Repeat Osseous Genioplasty	NA	1.73%	6.51%	NA	NA
Repeat BSSO	NA	NA	7.95%	4.40%	NA
Intraoperative Nerve Repair	≤1.01%	2.33%	8.79%	7.60%	2.30%

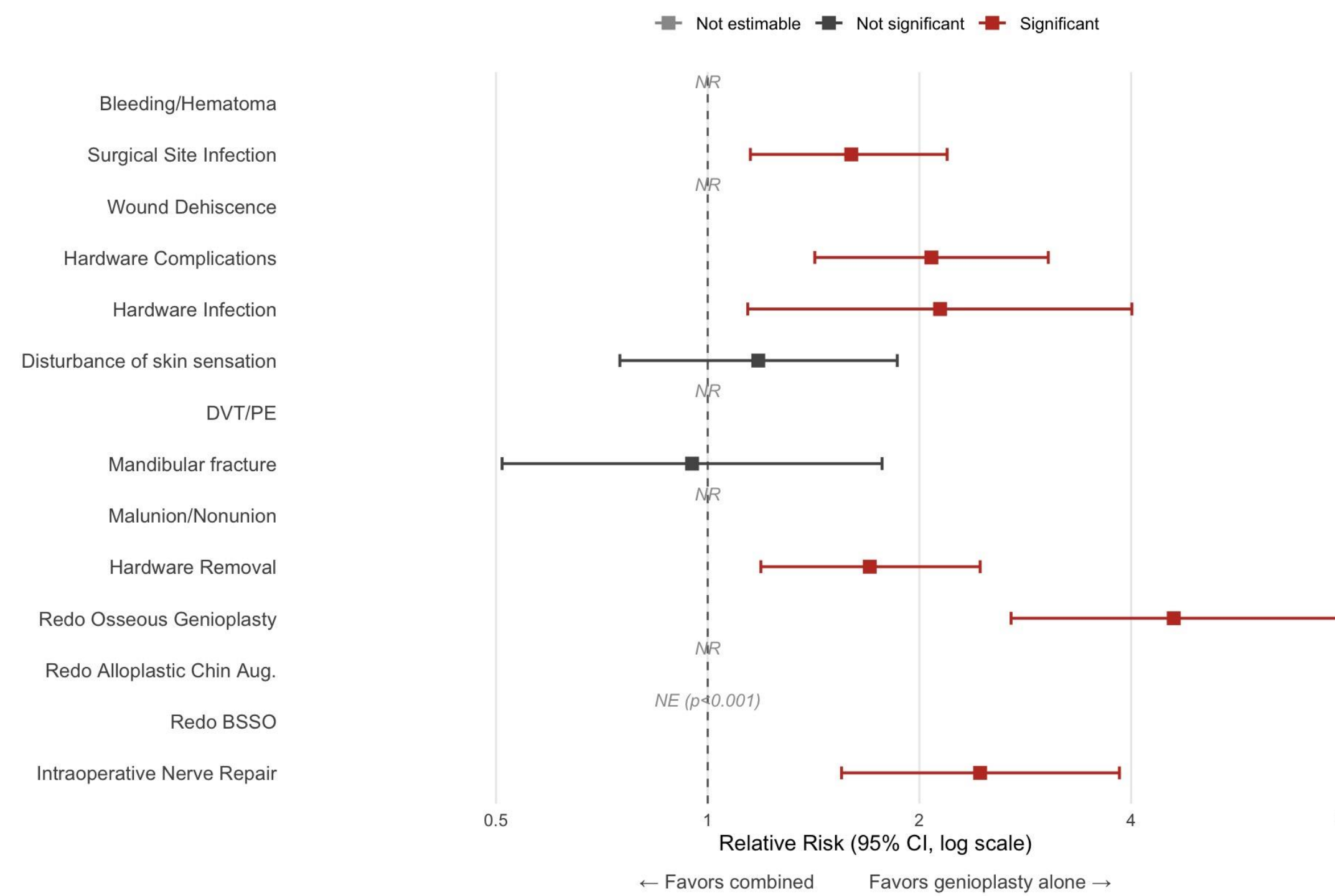
Alloplastic Chin Augmentation vs Osseous Genioplasty Alone (n=709)



Outcomes



Osseous Genioplasty + BSSO vs Osseous Genioplasty Alone (n=855)



Conclusions

- Osseous genioplasty is associated with higher 90-day complication rates** compared to alloplastic chin augmentation.
- Combined orthognathic procedures increase hardware-related complications and reoperation risk**, rather than overall complication burden alone.
- Procedure selection should be individualized**, balancing aesthetic goals with complication profiles to guide patient counseling and decision-making.