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A Nomogram for Prediction of 30-Day Morbidity and Mortality in Patients Undergoing Orthopaedic and Trauma Surgery during COVID-19 Era

Mohamed A Imam PhD FRCS,
Rowley Bristow Orthiopaedic Unit, Chertsey, UK

Faculty Disclosure Information

- No disclosures

Background

- Minimising postoperative complications and mortality in COVID-19 patients undergoing trauma and orthopaedic surgeries is a priority

- This study developed a predictive nomogram for 30-day morbidity/mortality in patients who underwent orthopaedic and trauma surgery during the coronavirus pandemic in the United Kingdom (UK) during the first peak wave of COVID-19 (2020).

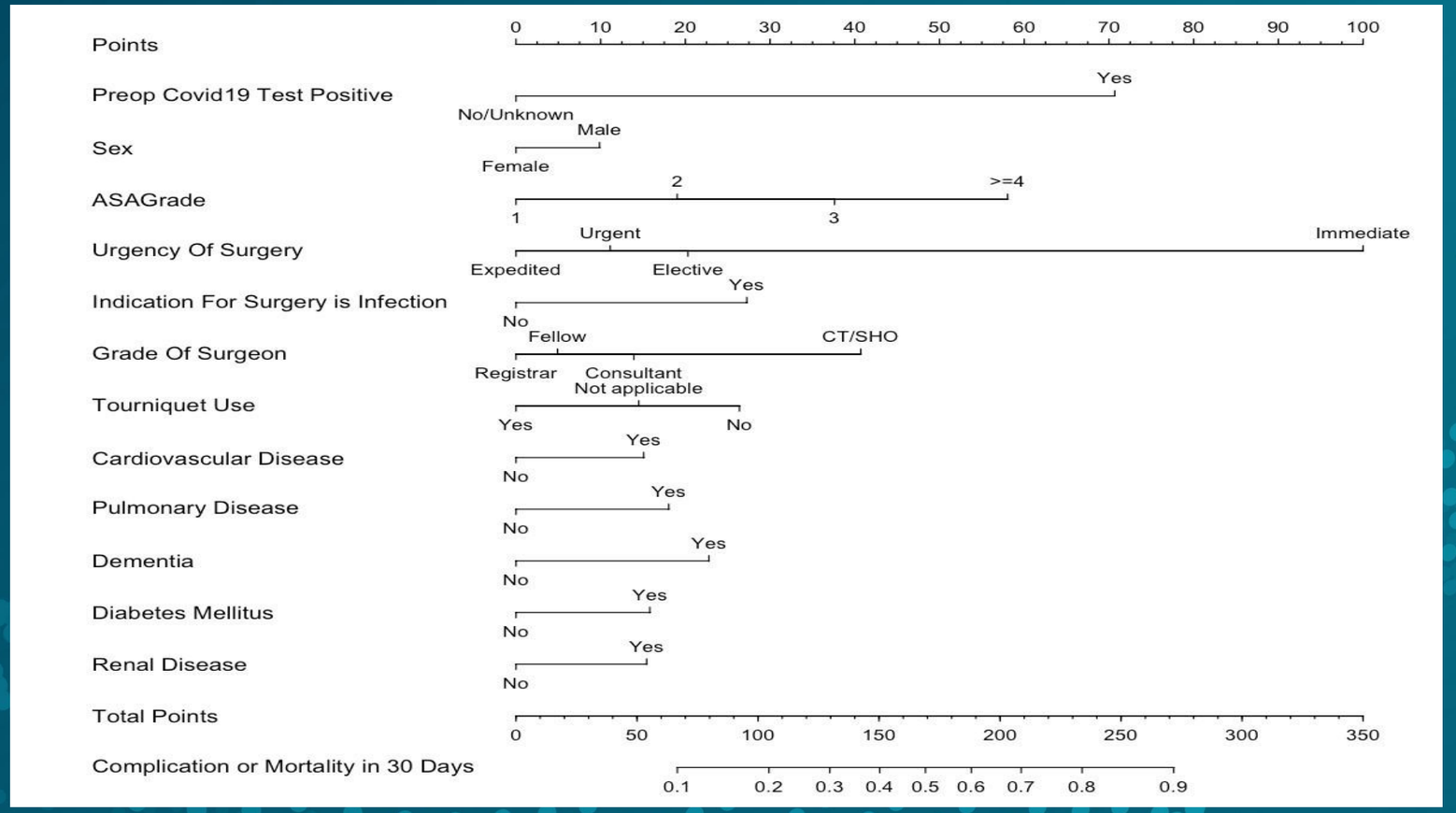
Methods

- Retrospective multicentre cohort study
- Patients with suspicion of SARS-CoV-2 infection who had undergone orthopaedic or trauma (bony or soft tissue procedure) surgery for any indication during the 2020 pandemic
- Multivariable logistic regression analysis was performed
- A nomogram was developed from the logistic regression model

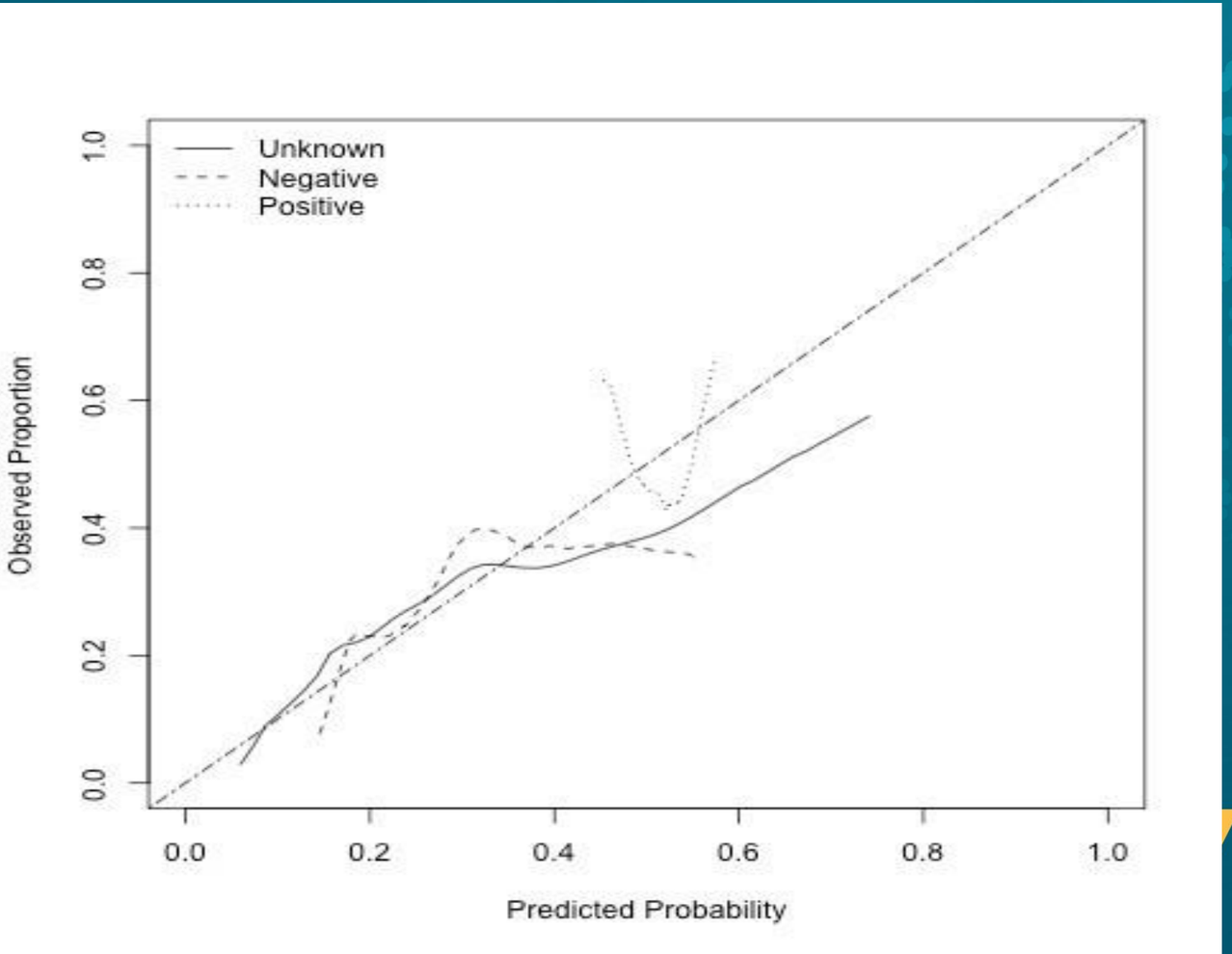
Results

- 2535 patients included
- Independent predictive variables of 30-day complications - Preoperative COVID-19 status, sex, ASA grade, urgency and indication of surgery, use of tourniquet, grade of the operating surgeon and comorbidities (like diabetes, and cardiovascular, renal, pulmonary and cognitive diseases).

Nomogram


Points
0 10 20 30 40 50 60 70 80 90 100
Preop Covid19 Test Positive
Yes
No/Unknown
Sex
Male
Female
ASAGrade
2
>=4
1
3
Urgency Of Surgery
Urgent
Immediate
Expedited
Elective
Indication For Surgery is Infection
Yes
No
Grade Of Surgeon
Fellow
CT/SHO
Registrar
Consultant
Not applicable
Tourniquet Use
Yes
No
Cardiovascular Disease
Yes
No
Pulmonary Disease
Yes
No
Dementia
Yes
No
Diabetes Mellitus
Yes
No
Renal Disease
Yes
No
Total Points
0 50 100 150 200 250 300 350
Complication or Mortality in 30 Days
0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8 0.9

Observed versus predicted probability of complications/mortality in our cohort based on COVID-19 status (Calibration; straight line)



Conclusions

- Orthopaedic and trauma surgeons can use nomograms developed in this study as a practical and effective tool in postoperative complications and mortality risk estimation.