Re: Shock-wave Lithotripsy for Pediatric Patients: Which Nomogram Can Better Predict Postoperative Outcomes? From Yanaral F, Ozgor F, Savun M, Agbas A, Akbulut F, Sarilar O

We read with great interest the article from Yanaral et al.[1]

Despite the advances of endourological procedures for the management of urolithiasis, extracorporeal shock wave lithotripsy (SWL) still remains a minimally invasive procedure with an excellent safety profile in frail patients, i.e children and elderly 1,2. However,[2] the prediction of SWL outcomes represents an up-to-date issue, especially when dealing with those patients. Two nomograms have been developed to for pediartics in the recent years, the 1 from Dogan et al[3] and the 1 from Onal and Coworkers.[4] The first includes gender, stone size, location, number of stones, age, and history of previous intervention as covariates and is developed with the aim to predict stone-free rate after a single session SWL.[3] The one from Onal similarly used age, stone burden, history of ipsilateral stone treatment, gender, and stone location as variables and predicts stone-free rate after 1, 2, and 3 sessions.[4]

Yanaral et al[1] analyzed the predictive performances of each model in a dataset of 219 children enrolled within a 3-years period at Haseki Training and Research Hospital, Istanbul. The Area Under the Curve (AUC) of Dogan tool was 0.699 and the AUC of Onal tool was 0.712, with regards to the outcomes after a single session SWL.

From a clinical point of view, we believe that this is the actual timing the prediction is worth to be applied to: both physicians and parents should be aware about the initial outcomes of a session and, therefore, how to expect from SWL also in terms of treatment length and hospital admission.

From a pure statistical point of view, an AUC less than 0.7 indicates a poor discrimination whereas ≥ 0.7 and < 0.8 indicates an acceptable discrimination[5]; as a result, the predictive performance of those models for the first SWL session is moderate and seems to be overcome by the prediction provided by a proper stone size measurement.

Beyond those comments, Authors should be recognized for the external validation of the most recently published nomograms predicting outcomes of SWL in pediatrics.

Actually, external validation is required to assess the transportability of a model in a population other than the development one. However, in the current analysis the validation dataset is similar to the development ones in terms of geographical area. Since the generalizability of a predictive model could be affected by temporal, geographical and domain issues,[6] we remind that the predictive performance of all nomograms—including the ones from Dogan and Onal—should be externally validated on each novel dataset before being clinically applied on it.

References

1. Yanaral F, Ozgor F, Savun M, Agbas A, Akbulut F, Sarilar O. Shock-wave lithotripsy for pediatric patients: which nomogram can better predict postoperative outcomes? *Urology*. 2018;117:126–130.
2. Sighinolfi MC, Micali S, Grande M, Mofferdin A, De Stefani S, Bianchi G. Extracorporeal shock wave lithotripsy in an elderly population: how to prevent complications and make the treatment safe and effective. J Endourol. 2008;22:2223-6.
3. Dogan HS, Altan M, Citamak B, et al. A new nomogram for prediction of outcome of pediatric shock-wave lithotripsy. *J Pediatr Urol*. 2015;11:84. e1-6
4. Onal B, Tansu N, Demirkesen O, et al. Nomogram and scoring system for predicting stone-free status after extracorporeal shock wave lithotripsy in children with urolithiasis. *BJU Int*. 2013;111:344–352.
5. Hosmer JDW, Lemeshow S, Sturdivant RX. *Applied Logistic Regression*. 3rd ed Hoboken, NJ, USA: John Wiley & Sons, Inc.; 2013.
6. Toll DB, Janssen KJM, Vergouwe Y, Moons KGM. Validation, updating and impact of clinical prediction rules: a review. *J Clin Epidemiol*. 2008;61:1085–1094.

Maria Chiara Sighinolfi*, Bernardo Rocco, Salvatore Micali, and Giampaolo Bianchi
Department of Urology, University of Modena and Reggio Emilia, Modena, Italy
E-mail: sighinolfic@yahoo.com (M.C. Sighinolfi).

Marco Sandri
Data Methods and Systems Statistical Laboratory, University of Brescia, Brescia, Italy

https://doi.org/10.1016/j.urology.2018.08.040
UROLOGY 123: 299, 2018.

Reply by the Authors: Shock-wave Lithotripsy for Pediatric Patients: Which Nomogram Can Better Predict Postoperative Outcomes?

The prediction of the success rate of shock-wave lithotripsy is an important issue, especially for pediatric patients. Therefore, clinicians should use these nomograms more often in daily practice to improve surgical planning. In our study, we compared the accuracy of the Onal and Dogan nomograms. We demonstrated that both nomograms are effective and independent predictors of stone-free rate. We used objective variables such as gender, age, stone size, number of stones, stone localization, and history of previous treatment. Also, our stone-free rates are in accordance with previous reports.[1] We used ultrasonography, intravenous urography, and plain X-ray as imaging methods in the diagnosis and follow-up, however, the results are prone

to observer bias. Plain computed tomography would have better determine the exact stone-free condition but exposure to radiation is an important issue in pediatric patients.

We appreciate the positive comments on our study. It is known that the new generation lithotripters and experience are effective on success rate and complications. Therefore, we agree that further prospective larger studies for external validation of these 2 nomograms in different populations are necessary. Furthermore, it is required to develop new nomograms that include the type of shockwave lithotripsy machine, the physicians' experience and predictive information for complications.

Reference

1. Jagtap J, Mishra S, Bhattu A, Ganpule A, Sabnis R, Desai M. Evolution of shockwave lithotripsy (SWL) technique: a 25-year single centre experience of > 5000 patients. *BJU Int.* 2014;114:748–753.

Fatih Yanaral, M.D.,
Faruk Ozgor, M.D., and
Omer Sarilar, M.D.
Department of Urology, Haseki Teaching and Research Hospital, Istanbul, Turkey
E-mail: fyanaral@yahoo.com (F. Yanaral).

https://doi.org/10.1016/j.urology.2018.09.011
UROLOGY 123: 299–300, 2018.