**Info for readme file to accompany article in *Bone & Joint Research***

Archived data pertaining to article:

Fletcher, J., Zderic, I., Gueorguiev, B., Richards, R., Whitehouse, M., Gill, R., Preatoni, E., in press. *Dataset for "Stripping torques in human bone can be reliably predicted prior to screw insertion with optimum tightness being found between 70% and 80% of the maximum".* Bath: University of Bath Research Data Archive. <https://doi.org/10.15125/BATH-00755>

Sheet 1 - Experimental stripping tests

*The data for finding the experimental stripping torque for each screw hole, compared to the experimental predictions.*

Bone sample number – which bone samples were used (all bone samples ranged from 1 to 15, from proximal to distal)

Test number – screw hole tested

Cortical thickness 1 (mm) – measurement of screw hole depth from proximal side

Cortical thickness 2 (mm) – measurement of screw hole depth from distal side

Average cortical thickness (mm) – average of cortical thickness 1 and 2

Experimental stripping torque (Nm) – maximum torque value recorded in destructive testing

Theoretical stripping torque (Nm) – based on Eq. 1

Plateau torque (Nm) – average torque recorded over last 60 degrees before screw head contact

Maximum raw compression force before stripping (N) – maximum compression force recorded before stripping occurred

Normalised max compression force before stripping (N/mm) – maximum compression force recorded before stripping occurred, normalised per mm of cortical thickness

Maximum compression force post stripping (N) – compression recorded by load cell after stripping of the screw hole had occurred

Normalised compression force post stripping (N/mm) – compression recorded by load cell after stripping of the screw hole had occurred, normalised per mm of cortical thickness

Maximum raw pullout force (N)

Normalised pullout force (N/mm) – maximum raw pullout force normalised per mm of cortical thickness

Sheet 2 – Optimisation data

*To calibrate Equation 1, non-linear optimisation was performed based on data from half of the initial samples (n=10) and used to predict the stripping torque for the second half of samples.*

Average cortical thickness (mm) - average of two measurements of the screw hole cortical thickness

Experimental stripping torque (Nm) – maximum torque value recorded in destructive testing

Average cortical thickness (mm)

Experimental stripping torque (Nm)

Theoretical stripping torque (Nm) – based on non-linear optimisation using Eq. 1

Sheet 3 - Variables for Eq. 1

*The values for the theoretical equation used to predict the stripping torque for a screw hole of depth ‘L’.*

TYS – Tensile Yield Stress

Pi - π

Dp - Pitch diameter

L - Length of screw engagement

r - Pitch radius of screw

p - Reciprocal threads per unit length

f - Coefficient of friction

Do – Outer diameter of screw

Sheet 4 – Compression and pullout data

*All recorded values for plateau torque, compression force and pullout force recorded against tightness (torque as a percentage of the stripping torque), ranked by target percentage of stripping torque.*

Sample no. - number of the sample tested

Hole no. – number of the screw hole tested

Cortical thickness 1 (mm) – measurement of pilot hole depth from proximal side

Cortical thickness 2 (mm) – measurement of pilot hole depth from distal side

Mean cortical thickness (mm) – average of cortical thickness 1 and 2

Target percentage of stripping torque (%) –10 samples per decile group

Theoretical stripping torque (Nm) – based on Eq. 1

Target torque (Nm) – the actual torque value that represents the targeted percentage torque for that drill hole

Plateau torque (Nm) - average torque over last 60 degrees before screw head contact

Insertion torque (Nm) – torque applied to inserted screw

Insertion torque as percentage of theoretical stripping torque (%)

Compression at plateau torque (N) – the average compression force recorded during the plateau torque

Maximum compression force (N) – maximum recorded compression force during insertion

Normalised maximum compression (N/mm) – maximum recorded compression force during insertion, normalised by cortical thickness

Maximum pullout force (N) – maximum recorded pullout force

Normalised maximum pullout force (N/mm) – maximum recorded pullout force, normalised by cortical thickness

Sheet 5 - Summary of compression data

*Final compression force values (N/mm) grouped in tightness deciles.*

Sheet 6 - Summary of pullout data

*Final pullout force values (N/mm) grouped in tightness deciles.*