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“You’re tearing me apart, Lisa!” – The force needed for Lisa to pull off Johnny’s arm (from the movie *The Room*)

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Abstract:

In the 2003 cult classic American drama *The Room*, during an argument between the two leads Johnny and Lisa, Johnny says “you’re tearing me apart, Lisa!” This paper investigates the force required by Lisa to literally detach Johnny’s arm from his body. The ultimate tensile strength of the glenoid labrum (the weakest segment of the arm, where it meets the shoulder) was found to be 6390000 Nm^{-2} , and the cross-sectional area of Johnny’s arm was determined to be $3.14 \times 10^{-4} \text{ m}^2$. This allowed the force to be calculated as 2006.46 N. It was concluded that it would not be possible for Lisa to detach Johnny’s arm, with her maximum pulling force being 614.49 N (31 % of the actual force needed).

Introduction

The Room is an independent American drama film released in 2003. Tommy Wiseau (who wrote, produced and directed the film) stars as its main protagonist ‘Johnny’ [1]. Considered by many to be one of the worst feature films ever created, it has also achieved cult status due to questionable acting, a bizarre plot, and very poor – albeit hilarious – dialogue. One such line from the movie is quoted by fans across the world; “You’re tearing me apart, Lisa!” Johnny exclaims to his fiancée Lisa, during a heated argument. Despite Johnny referring to the emotional turmoil Lisa is inflicting on him, this paper will look into the force needed by Lisa to literally tear Johnny apart.

Method and Analysis

The act of tearing Johnny apart will be clarified.

As seen in figure 1, it will be assumed that tearing Johnny apart entails applying a pulling force to an arm along its longitudinal axis; this should be enough to detach an arm from Johnny’s abdomen. It will be assumed that Johnny’s arms are cylindrical, and that the force that acts on Johnny’s limb does so uniformly.

To calculate the force needed for this to occur, the ultimate tensile strength (equation 1) is considered:



Figure 1 – A silhouette of Johnny with his arms outstretched. The dashed lines represent the point at which his arms must be detached, and the arrows represent the direction of the force [2].

$$\text{Ultimate tensile strength} = \frac{\text{Ultimate force}}{\text{Original cross sectional area}} \quad (1)$$

Ultimate tensile strength resists tension (or the axial pulling force). Therefore, the ultimate tensile strength of a material is the pulling force a material can endure before breaking [3].

The weakest part of the human arm is where the upper arm meets the shoulder: the glenoid labrum [4]. If Lisa were to attempt to tear Johnny’s arm off, it would most likely detach at the glenoid labrum.

Tommy Wiseau is an extremely secretive person, and his ethnicity and history remain a mystery. However, it is known that at the time of filming, he was 42 years old [5].

Reeves, in 1966, conducted mechanical tests on newly deceased human corpses [6]. Using the results obtained from the paper he published, the average tensile strength of the glenoid labrum in a human male between the ages of 40 and 50 is 6.39 MPa, or 6390000 Nm⁻² [6].

Next, the cross-sectional area of Johnny’s arm must be determined. Considering the actor Tommy Wiseau’s height to be 174 cm, the diameter of his arm can be determined by analysing different shots of him in the film, and comparing his height to the size of his arms on screen. An online application that measures the distance between pixels was used to find out his height : arm-diameter ratio [7]. Therefore, the diameter of his arm – specifically where his upper arm meets his shoulder – is 20cm. This means that the cross-sectional area is:

$$\pi r^2 = \pi(0.01)^2 = 3.14 \times 10^{-4} m^2 \quad (2)$$

Thus, the cross-sectional area (3.14×10⁻⁴ m²) and ultimate tensile strength (6390000 Nm⁻²) can be substituted into equation 1 to determine the force

needed for Lisa to detach Johnny’s arm from his body, which was calculated to be 2006.46 N. This is large; it would take at least four horses walking at a typical speed of 1m/s in the same direction (away from the arm longitudinally) to detach Johnny’s arm from his body at the glenoid labrum [8].

Now that the force is known, the feasibility of Lisa actually being able to pull Johnny’s arm off can be inferred. Juliette Danielle, the actress who played Lisa, was 33 years old during filming [9]. Ergonomic data of females between the ages of 31 and 50 shows that if the character of Lisa used both arms to horizontally pull on one of Johnny’s arms (along the longitudinal axis), she could employ a possible maximum pulling force of 614.49 N, which is only 31% of the force actually needed to pull Johnny’s arm from his body [10]. Therefore, Lisa would be unable to tear Johnny apart by detaching his arm.

Conclusion

Using the principle of ultimate tensile strength (equation 1) the force needed to pull off Johnny’s arm from his body – longitudinally – was calculated to be 2006.46 N. This is assuming the force is uniformly spread through the arm. Lisa would not be able to detach Johnny’s arm as her maximum possible pulling force would be 614.49 N (31 % of the force required to detach his arm).

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