

**Figure S1**. Aliasing segmentation correction. a) Rectangular aOCT image with initial segmentation line (red) overlayed. Yellow boxed region is the aliasing region. b) Zoomed region of yellow boxed area in a). Upper red dotted line in the upper panel in b) is the original segmentation line from semi-automated segmentation. Green line is the manually corrected inner surface of the airway. Lower red solid line is the mirrored (anti-aliased) segmentation of green line based on the bottom of the image. Two yellow vertical lines indicate the A-line where aliasing happened. Two blue arrows indicate the direction of the mirroring of the aliasing region segmentation. Lower panel in (b) is an added region to accommodate the mirrored segmentation. c) Original circular aOCT image with aliasing. d) Aliasing-corrected circular aOCT image with segmentation overlayed (green line).

## Normalized Cross-sectional Compliance (nCsC):

If we assume the airway wall is an isotropic and linearly elastic material, the compliance can be described using a thick-walled tube model. The expressions of stress for the thick-wall tube model are:<sup>32</sup>

$$\sigma_r = \frac{A}{r^2} + B, \ \sigma_\theta = -\frac{A}{r^2} + B, \ \sigma_z = B, \tag{1}$$

where  $\sigma_r$  is the radial stress,  $\sigma_{\theta}$  is the circumferential stress and  $\sigma_z$  is the axial stress, and

$$A = \frac{a^2 b^2 (p_0 - p_i)}{b^2 - a^2}, \quad B = \frac{p_i a^2 - p_0 b^2}{b^2 - a^2},$$
(2)

where *a* is inner radius and *b* is outer radius,  $p_o$  is the outer pressure applied to the tube and  $p_i$  is the inner pressure applied to the tube.

Then the tangential strain is determined by:

$$\varepsilon_{\theta} = \frac{1}{E} (\sigma_{\theta} - \nu (\sigma_r + \sigma_z)), \tag{3}$$

where E is the Young's modulus and  $\nu$  is the Poisson's ratio of the tube material.

If u is the radial displacement and v is the tangential displacement, then

$$\varepsilon_{\theta} = \frac{u}{v} + \frac{\partial v}{r\partial \theta},\tag{4}$$

Because the system is axisymmetric, there is no angular dependence and the radial displacement can be written as  $u = r\varepsilon_{\theta}$ .

To model the change in cross-sectional area, we need to determine the change in radial (luminal) radius  $\Delta a$ , which can be calculated as the difference in *u* between two pressure values at the inner surface of the tube where r = a:

$$\Delta a = a(\varepsilon_{\theta}(r = a, p_i = p_o + \Delta p) - \varepsilon_{\theta}(r = a, p_i = p_o)),$$
(5)

Where  $\Delta p = p_i - p_o$ , then

$$\Delta a = a \cdot \Delta p \cdot x, \ x = \frac{1}{E} \frac{b^2 (1+\nu) + a^2 (1-2\nu)}{b^2 - a^2}, \tag{6}$$

Then the change in cross-sectional area due to the pressure change can be expressed as:

$$\Delta CSA = \pi (a + \Delta a)^2 - \pi a^2 \approx 2\pi a \Delta a, \tag{7}$$

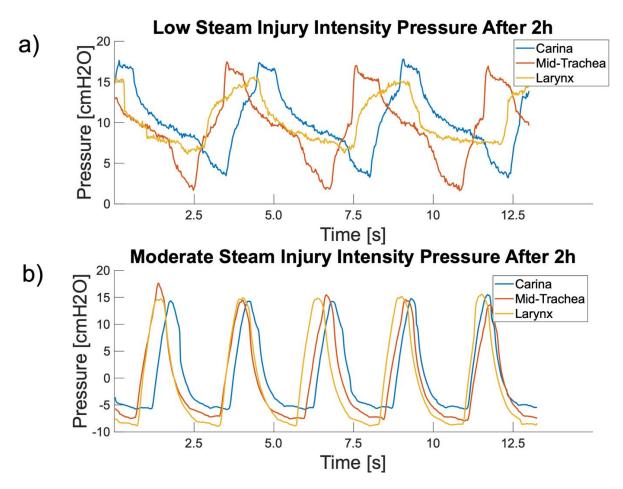
where the approximation is valid when  $\Delta a$  is small compared to a. We then obtain for the compliance

$$CC = \frac{\Delta CSA}{\Delta p} \approx \frac{2\pi a^2 \Delta p x}{\Delta p} = 2\pi a^2 x.$$
(8)

The normalized cross-sectional compliance can then be expressed as:

$$nCsC = \frac{CC}{avgCSA} = \frac{2\pi a^2 x}{\pi a^2} = 2x.$$
(9)

Importantly, the normalization takes away much of the dependence on the overall cross-sectional size, with the caveat that the *x* parameter does still have a dependence on the inner and outer wall thicknesses (*a* and *b*, respectively). In the special case where a/b is constant (wall thickness scales with wall diameter), *x* is fully independent of size. Thus, the normalized cross-sectional compliance (nCsC) reflects the mechanical properties of the airway wall and is nominally independent of the cross-sectional area.



**Figure S2.** Pressure measured at different locations at the same time point on both low and moderate steam injury pigs. a) Low steam injury intensity pressure measurement at 2h after the injury at carina, mid-trachea and larynx. b) Moderate steam injury intensity pressure measurement at 2h after the injury at carina, mid-trachea and larynx.

Intensity LevelTime Location*Location* [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2] [Imm2]Interposition [9%/cmH2Q]*** [9%/cmH2Q]**LowBefore / 0h0.75 $70.8 \pm 1.0$ $1.13 \pm 0.20$ $1.60 \pm 0.29$ LowBefore / 0h0.85 $70.7 \pm 0.5$ $1.18 \pm 0.18$ $1.63 \pm 0.25$ LowAfter / 0h0.85 $70.7 \pm 0.5$ $1.18 \pm 0.18$ $1.69 \pm 0.52$ LowAfter / 0h0.85 $57.9 \pm 0.2$ $0.54 \pm 0.05$ $0.94 \pm 0.08$ LowAfter / 0h0.85 $53.5 \pm 0.5$ $0.84 \pm 0.09$ $1.57 \pm 0.17$ Low0.5h0.66 $58.3 \pm 0.3$ $0.22 \pm 0.04$ $0.39 \pm 0.07$ Low0.5h0.85 $53.5 \pm 0.5$ $0.84 \pm 0.09$ $1.57 \pm 0.17$ Low1h0.85 $53.5 \pm 0.3$ $0.57 \pm 0.07$ $0.96 \pm 0.12$ Low2h0 $59.5 \pm 0.9$ $0.57 \pm 0.07$ $0.96 \pm 0.12$ Low2h1 $55.3 \pm 0.4$ $0.80 \pm 0.10$ $1.44 \pm 0.18$ Low4h0 $65.2 \pm 0.8$ $1.83 \pm 0.32$ $2.81 \pm 0.49$ Low4h0.75 $58.5 \pm 0.3$ $0.31 \pm 0.07$ $0.52 \pm 0.13$ Low4h0.75 $56.8 \pm 0.4$ $0.23 \pm 0.06$ $0.41 \pm 0.10$ ModerateBefore / 0h0 $118.4 \pm 2.7$ $1.47 \pm 0.28$ $1.24 \pm 0.24$ ModerateBefore / 0h0 $116.4 \pm 1.2$ $0.99 \pm 0.06$ $0.77 \pm 0.05$ Mod	Intensity			Average CSA	CC	nCsC
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Low6h $0.75$ $56.8 \pm 0.4$ $0.23 \pm 0.06$ $0.41 \pm 0.10$ ModerateBefore / 0h0 $118.4 \pm 2.7$ $1.47 \pm 0.28$ $1.24 \pm 0.24$ ModerateBefore / 0h $0.33$ $136.4 \pm 3.2$ $3.99 \pm 0.26$ $2.92 \pm 0.19$ ModerateBefore / 0h1 $131.5 \pm 1.0$ $2.26 \pm 0.13$ $1.72 \pm 0.10$ ModerateBefore / 0h1 $131.5 \pm 1.0$ $2.26 \pm 0.13$ $1.72 \pm 0.10$ Moderate2h0 $116.2 \pm 1.2$ $0.90 \pm 0.06$ $0.77 \pm 0.05$ Moderate2h $0.33$ $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate2h $1$ $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.04$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.04$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.02$ $0.52 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.52 \pm 0.23$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.35 \pm 0.10$ $0.92 \pm 0.17$ Severe2h $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe	Low	4h	1	$52.5 \pm 0.4$	$1.19 \pm 0.22$	$2.26 \pm 0.43$
ModerateBefore / 0h0 $118.4 \pm 2.7$ $1.47 \pm 0.28$ $1.24 \pm 0.24$ ModerateBefore / 0h0.33 $136.4 \pm 3.2$ $3.99 \pm 0.26$ $2.92 \pm 0.19$ ModerateBefore / 0h1 $131.5 \pm 1.0$ $2.26 \pm 0.13$ $1.72 \pm 0.10$ Moderate2h0 $116.2 \pm 1.2$ $0.90 \pm 0.06$ $0.77 \pm 0.05$ Moderate2h0.33 $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate2h1 $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.32 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.32 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.23$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.18$ $1.52 \pm 0.23$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h $0.33$ $61.4 \pm 1.0$ $0.39$	Low	6h	0.66	$55.5 \pm 0.5$	$0.29\pm0.07$	$0.52 \pm 0.13$
ModerateBefore / 0h $0.33$ $136.4 \pm 3.2$ $3.99 \pm 0.26$ $2.92 \pm 0.19$ ModerateBefore / 0h1 $131.5 \pm 1.0$ $2.26 \pm 0.13$ $1.72 \pm 0.10$ Moderate2h0 $116.2 \pm 1.2$ $0.90 \pm 0.06$ $0.77 \pm 0.05$ Moderate2h $0.33$ $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate2h1 $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.02$ $0.36 \pm 0.02$ Moderate4h0 $116.4 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.02$ $0.52 \pm 0.03$ Moderate4h0 $116.4 \pm 0.9$ $0.31 \pm 0.02$ $0.52 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h $0.66$ $56.9 \pm 0.3$ <t< td=""><td>Low</td><td>бh</td><td>0.75</td><td><math>56.8 \pm 0.4</math></td><td><math>0.23 \pm 0.06</math></td><td><math>0.41 \pm 0.10</math></td></t<>	Low	бh	0.75	$56.8 \pm 0.4$	$0.23 \pm 0.06$	$0.41 \pm 0.10$
ModerateBefore / 0h1 $131.5 \pm 1.0$ $2.26 \pm 0.13$ $1.72 \pm 0.10$ Moderate2h0 $116.2 \pm 1.2$ $0.90 \pm 0.06$ $0.77 \pm 0.05$ Moderate2h $0.33$ $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate2h1 $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0.33 $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$	Moderate	Before / 0h	0	$118.4 \pm 2.7$	$1.47 \pm 0.28$	$1.24 \pm 0.24$
Moderate $2h$ $0$ $116.2 \pm 1.2$ $0.90 \pm 0.06$ $0.77 \pm 0.05$ Moderate $2h$ $0.33$ $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate $2h$ $1$ $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate $4h$ $0$ $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate $4h$ $0.33$ $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate $4h$ $1$ $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ Moderate $4h$ $1$ $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h $0.66$ $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereAfter / 0h $0.66$ $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h $1$ $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe $2h$ $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe $2h$ $0.66$ $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	Before / 0h	0.33	$136.4 \pm 3.2$	$3.99 \pm 0.26$	$2.92 \pm 0.19$
Moderate $2h$ $0.33$ $106.1 \pm 0.7$ $0.38 \pm 0.03$ $0.36 \pm 0.03$ Moderate $2h$ 1 $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate $4h$ 0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate $4h$ 0.33 $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate $4h$ 1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ Moderate $4h$ 1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h $0.66$ $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h $0.66$ $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ Severe $2h$ $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe $2h$ $0.66$ $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	Before / 0h	1	$131.5 \pm 1.0$	$2.26\pm0.13$	$1.72 \pm 0.10$
Moderate $2h$ 1 $73.9 \pm 0.4$ $0.27 \pm 0.02$ $0.37 \pm 0.02$ Moderate $4h$ 0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate $4h$ $0.33$ $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate $4h$ 1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.14$ Severe $2h$ $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe $2h$ $0.66$ $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	2h	0	$116.2 \pm 1.2$	$0.90 \pm 0.06$	$0.77 \pm 0.05$
Moderate4h0 $116.4 \pm 0.9$ $0.41 \pm 0.03$ $0.36 \pm 0.03$ Moderate4h0.33 $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ Severe2h0.33 $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h0.66 $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	2h	0.33	$106.1 \pm 0.7$	$0.38\pm0.03$	$0.36 \pm 0.03$
Moderate4h $0.33$ $102.3 \pm 0.9$ $0.30 \pm 0.04$ $0.30 \pm 0.03$ Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h $0.66$ $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	2h	1	$73.9 \pm 0.4$	$0.27\pm0.02$	$0.37 \pm 0.02$
Moderate4h1 $69.4 \pm 0.5$ $0.36 \pm 0.02$ $0.52 \pm 0.03$ SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h0.33 $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$	Moderate	4h	0	$116.4 \pm 0.9$	$0.41 \pm 0.03$	$0.36 \pm 0.03$
SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h0.33 $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h0.66 $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	Moderate	4h	0.33	$102.3 \pm 0.9$	$0.30 \pm 0.04$	$0.30 \pm 0.03$
SevereBefore / 0h0.66 $82.6 \pm 1.7$ $1.22 \pm 0.18$ $1.52 \pm 0.22$ SevereBefore / 0h1 $81.2 \pm 1.2$ $1.02 \pm 0.19$ $1.25 \pm 0.23$ SevereAfter / 0h0.66 $41.7 \pm 0.8$ $0.38 \pm 0.06$ $0.92 \pm 0.14$ SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h0.33 $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h0.66 $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$	-					
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SevereAfter / 0h1 $60.2 \pm 1.0$ $0.55 \pm 0.10$ $0.92 \pm 0.17$ Severe2h0.33 $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h0.66 $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$			0.66			
Severe2h $0.33$ $61.4 \pm 1.0$ $0.39 \pm 0.06$ $0.63 \pm 0.11$ Severe2h $0.66$ $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$			1			
Severe         2h         0.66 $56.9 \pm 0.3$ $0.23 \pm 0.02$ $0.41 \pm 0.03$			0.33		$0.39 \pm 0.06$	

Table S1. nCsC data collected from all available aOCT scans

\*The location column in the table uses a 0 to 1 system for labeling: 0 represents the distal end near the carina, and 1 represents the proximal end near the larynx, with decimal values indicating intermediate locations. \*\* Error bar means standard error.

Table 52. Rese Theory A results							
Source	Df	Sum Sq	Mean Sq	F value	p value		
Intensity Level	1	1.271	1.271	2.659	0.115		
Position	1	0.650	0.650	1.360	0.254		
Time	1	5.506	5.506	11.515	0.002	**	
Intensity Level : Position	1	1.637	1.637	3.424	0.076		
Intensity Level : Time	1	0.588	0.588	1.230	0.278		
Position : Time	1	0.649	0.649	1.358	0.255		
Intensity Level : Position :							
Time	1	0.031	0.031	0.065	0.800		
Residual	26	12.432	0.478				
Total	33	22.764					
	0.01 (*** 0.0	- ( ) 0 1 ( ) 1					

Table S2. nCsC ANOVA results

Signif. codes: 0 \*\*\*\* 0.001 \*\*\* 0.01 \*\* 0.05 .. 0.1 \* 1

P values are Bonferroni corrected

Table S3.	nCsC l	inear	regression	results

	Slope	Std. error	t-ratio	p value	
Intensity Level	-0.936	0.530	-1.768	0.089	
Position	-2.473	1.186	-2.085	0.047	*
Time	-0.268	0.375	-0.716	0.481	
Intenstiy Level : Position	0.971	0.660	1.472	0.153	
Intensity Level : Time	-0.038	0.223	-0.172	0.865	
Position : Time	0.319	0.501	0.637	0.530	
Intensity Level : Position :					
Time	-0.076	0.296	-0.256	0.800	
Constant	3.558	0.932	3.817	0.001	_

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1 P values are Bonferroni corrected

	Df	Sum Sq	Mean Sq	F value	p value	_
Intensity Level	1	0.404	0.404	1.391	0.738	
Position	1	14.926	14.926	51.463	5.82E-08	***
Intensity Level :						
Position	1	0.005	0.005	0.016	2.703	
Residual	36	10.441	0.290			
Total	39	25.776				_

Table S4. Histology score ANOVA results

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

P values are Bonferroni corrected

Table S5. Histology score linear regression results							
	Slope	Std. error	t-ratio	p value	_		
Intensity Level	0.128	0.226	0.568	1.720			
Position	2.209	0.736	3.001	0.015	*		
Intensity Level :							
Position	-0.046	0.369	-0.125	2.703			
Constant	0.799	0.446	1.789	0.246	_		

Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

P values are Bonferroni corrected