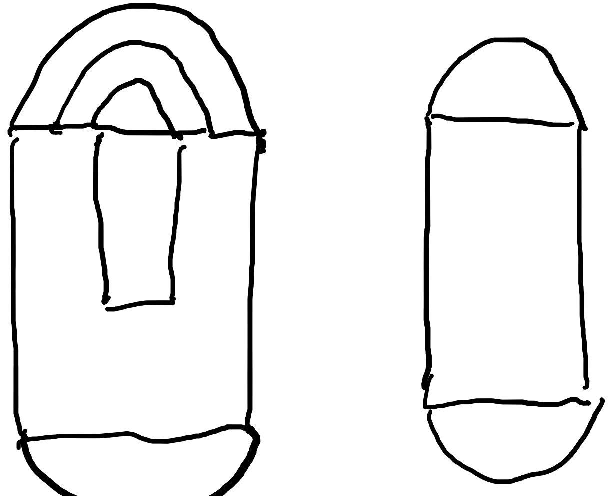
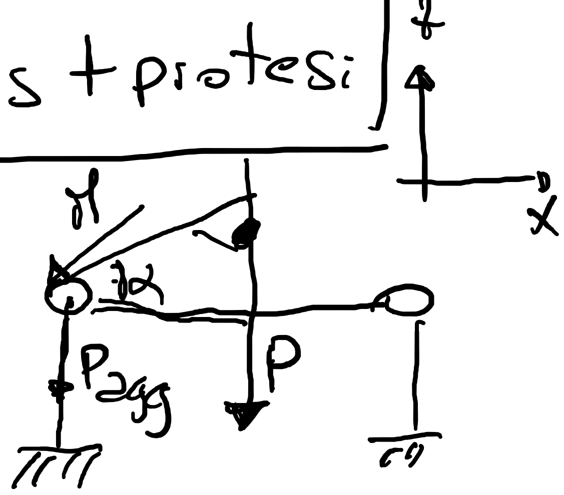
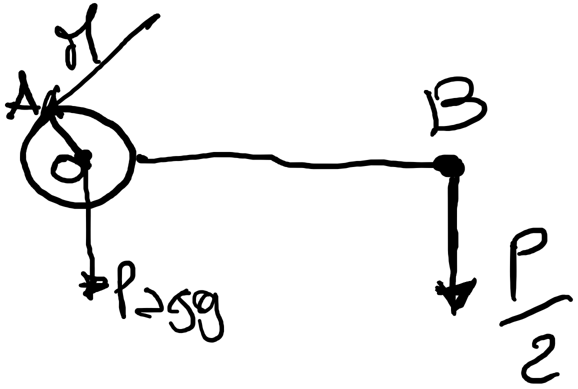
$$\boxed{\varepsilon_{osso\ sano} = \varepsilon_{oss\ res + protesi}}$$





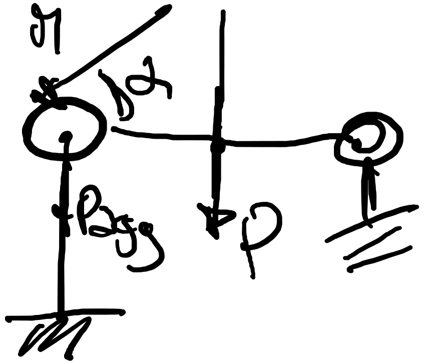
$$R_z = -\frac{P}{2} - P_{agg} - M\sin\alpha \qquad \alpha = 16°$$

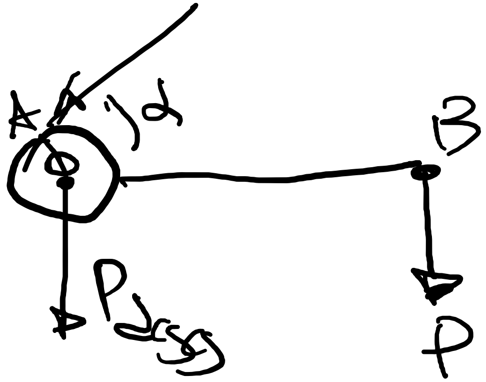
$$R_{xy} = -M\cos\alpha$$



$$M \cdot OA = OB \cdot \frac{P}{2} \qquad M = \overbrace{\frac{OB}{OA}}^{K} \cdot \frac{P}{2}$$

$$\begin{cases} R_z = -\frac{P}{2} - P_{agg} - \frac{K}{2} P\sin\alpha \\ R_{xy} = -\frac{K}{2} P\cos\alpha \end{cases}$$





$$\alpha = 45^\circ$$

$$R_z = -P - P_{ogg} - M \sin\alpha$$

$$R_{xy} = -M\cos\alpha$$

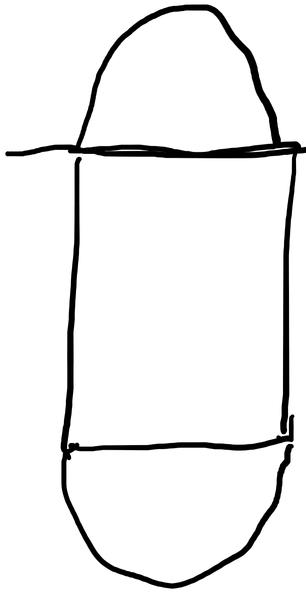
$$M\,OA = P\,OB \qquad M = P\frac{OB}{OA} = PK$$

$$R_z = -P - P_{ogg} - PK\sin\alpha$$

$$R_{xy} = -PK\cos\alpha$$

$\varepsilon_{oss.\ sano} = \varepsilon_{oss\ res + protesi}$ $\qquad K = \frac{OB}{OA}$

metodo puntuale semplificato



I

II

comport I

$$\varepsilon_Z = \frac{R_z}{A_z E_{ep}} = \frac{R_z}{2\pi R^2_{ep1}} \cdot \frac{1}{E_{os}} =$$

$$|R_z| = |-P - P_{ogg} - M \sin\alpha = -P - P_{ogg} - K P \sin\alpha|$$

$$= 700 + 100 + 10 \cdot 700 \cdot 0.7 = 5700\,N$$

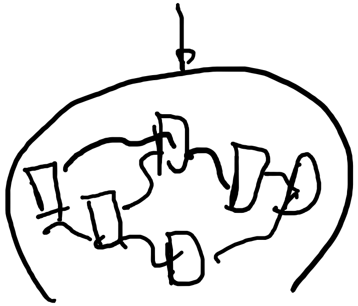
$$|R_{xy}| = |-K P \cos\alpha| = |10 \cdot 700 \; 0.7| = 4900\,N$$

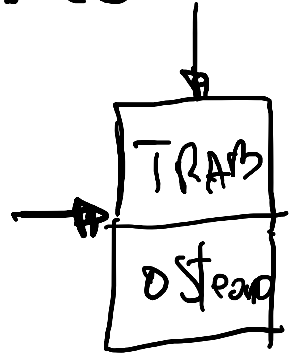
$$\underline{\varepsilon_z} = \frac{5700}{6.28 \cdot 4 \cdot 10^{-4} \cdot 0.5 \cdot 10^{9}} = 453 \cdot 10^{-5}$$

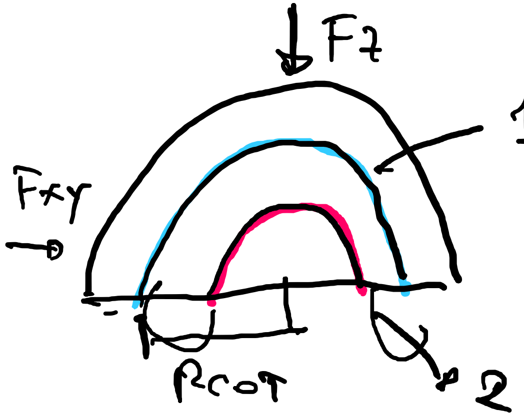
strain = $\underline{4530\ \mu\text{strain}}$

$$\varepsilon_{xy} = \frac{R_{xy}}{A_{xy}} \cdot \frac{1}{E_{os}} = \frac{4900}{\frac{2}{3}\pi \frac{R_{cpr}^{3}}{h_{cpr}}} \cdot \frac{1}{0.5 \cdot 10^{9}} = \frac{4900 \cdot 3\ 2.2 \cdot 10^{-2}}{3.14\ 8 \cdot 10^{-6}\ 10^{9}}$$

$$\underline{\varepsilon_{xy}} = \frac{323,4}{25.11 \cdot 10^{3}} \simeq 13 \cdot 10^{-3} = \underline{13\ \text{m strain}}$$







$R_{COT} = R_T + \underline{\delta_{COT}}$

$$\boxed{\varepsilon_z} = \frac{R_z}{2\pi \underline{R^2_{MB}}} \cdot \frac{1}{E_{MB}} + \frac{R_z}{2\pi R^2_{COT}} \cdot \frac{1}{E_{COT}} + \frac{R_z}{2\pi R^2_{tes}} \frac{1}{E_{TES}}$$

"RAC

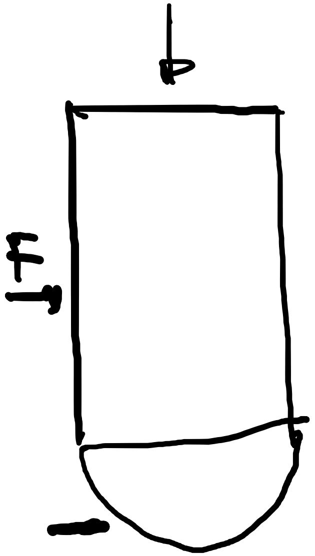
$$\boxed{\varepsilon_{xy}} = \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{MB}}{h_{MB}}} \cdot \frac{1}{E_{MB}} + \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{COT}}{h_{COT}}} \cdot \frac{1}{E_{COT}} + \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{TES}}{h_{TES}}} \cdot \frac{1}{E_{TES}}$$

Isostress

$\sigma^I_{xy} = \sigma^I_z$

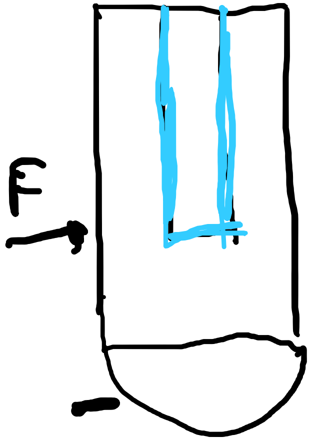
1 $$\frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{COT}}{h_{COT}}} = \frac{R_z}{2\pi R^2_{COT}} \rightarrow \frac{R_{xy}}{R_z} \cdot 3h_{COT} = R_{COT}$$

2 $$\frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{TEST}}{h_{TEST}}} = \frac{R_z}{2\pi R^2_{TEST}} \rightarrow \frac{R_{xy}}{R_z} \cdot 3h_{TEST} = R_{TEST}$$



$$\boxed{\varepsilon_z} = \frac{R_z}{\pi R^2_f} \cdot \frac{1}{E^z_{oc}} + \frac{R_z}{\pi R^2_{ep_2}} \cdot \frac{1}{E_{os}}$$

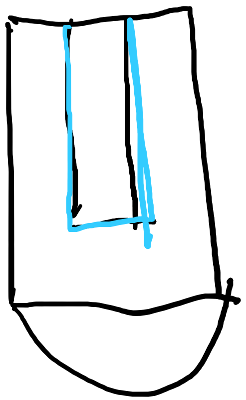
$$\boxed{\varepsilon_{xy}} = \frac{R_{xy}}{2\pi R_f \cdot h_f} \frac{1}{E^{xy}_{oc}} + \frac{R_{xy}}{\frac{\frac{2}{3}\pi R^3_{ep_2}}{h_{ep_2}}} \cdot \frac{1}{E_{os}}$$



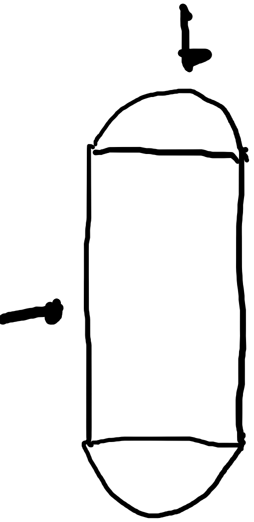
$$\varepsilon_z = \frac{R_z}{\pi R^2_{st}} \cdot \frac{1}{E_{st}} + \frac{R_z}{\pi (R^2_f - R^2_{st})} \cdot \frac{1}{E^z_{or.c.}} + \frac{R_z}{\pi R^2_{ep_2}} \cdot \frac{1}{E_{os}}$$

$$E_{or} = E_o (1 - f_{st})^{\alpha}$$

$$\varepsilon_{xy} = \frac{R_{xy}}{2\pi r_f \cdot h_f} \cdot \frac{1}{E^{xy}_{oc.r}} + \frac{R_{xy}}{2\pi r_{st} h_{st}} \cdot \frac{1}{E_{st}} + \frac{R_{xy}}{\frac{\frac{2}{3}\pi R^3_{ep_2}}{h_{ep}}} \cdot \frac{1}{E_{os}}$$

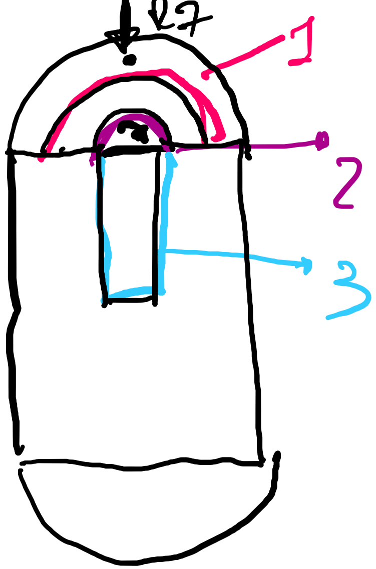


$$\sigma_{xy} = \sigma_z \qquad \frac{R_{xy}}{2\pi r_{st} h_{st}} = \frac{R_z}{\pi r_{st}^2} \rightarrow r_{st} = \frac{R_z}{R_{xy}} \cdot 2h_{st}$$



$$\boxed{\varepsilon_z} = \frac{R_z}{2\pi R_{ep1}^2} \cdot \frac{1}{E_{os}} + \frac{R_z}{\pi R_f^2} \cdot \frac{1}{E_{oc}^z} + \frac{R_z}{\pi R_{ep2}^2} \cdot \frac{1}{E_{os}}$$

$$\boxed{\varepsilon_{xy}} = \frac{R_{xy}}{\frac{2}{3}\pi \frac{R_{ep1}^3}{h_{ep1}}} \cdot \frac{1}{E_{os}} + \frac{R_{xy}}{2\pi R_f \cdot h_f} \cdot \frac{1}{E_{oc}^{xy}} + \frac{R_{xy}}{\frac{2}{3}\pi \frac{R_{ep2}^3}{h_{ep2}}} \cdot \frac{1}{E_{os}}$$



$l_{\Pi B\,est}$

$l_{\Pi B\,int} = l_{cot\,est}$

$l_{cot\,int} = l_{\$est}$

l_{st}

h_{st}

$l_{\Pi B est} = l_{c.a}$

δ_{COT}

$l_{COT est} = l_t + \delta_{COT}$

$$\varepsilon_z = \frac{R_z}{2\pi R^2_{\Pi B}} \cdot \frac{1}{E_{\Pi B}} + \frac{R_z}{2\pi R^2_{COT}} \cdot \frac{1}{E_{COT}} + \frac{R_z}{2\pi R^2_{TEST}} \cdot \frac{1}{E_{TEST}} + \frac{R_z}{\pi R^2_{st}} \cdot \frac{1}{E_{ST}} +$$

$$+ \frac{R_z}{\pi\left(R^2_{fem} - R^2_{st}\right)} \cdot \frac{1}{E^z_{OCR}} + \frac{R_z}{\pi R^2_{ep?}} \cdot \frac{1}{E_{OST}}$$

$$\varepsilon_{xy} = \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{\Pi B}}{h_{\Pi B}}} \cdot \frac{1}{E_{\Pi B}} + \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{COT}}{h_{COT}}} \cdot \frac{1}{E_{COT}} + \frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{TESI}}{h_{TESI}}} \cdot \frac{1}{E_{TESI}} + \frac{R_{xy}}{2\pi l_f h_f} \cdot \frac{1}{E^{xy}_{OCR}} + \frac{R_{xy}}{2\pi s_t h_{st}} \cdot \frac{1}{E}$$

$$+ \frac{R_{xy}}{\frac{2}{3}\pi \frac{R_{ep2}^3}{h_{ep2}}} \cdot \frac{1}{E_{ost.}}$$

iso 1) $\sigma_{xy} = \sigma_z$

$$\frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{cot}}{h_{cot}}} = \frac{R_z}{2\pi R^2_{cot}}$$

iso 2)

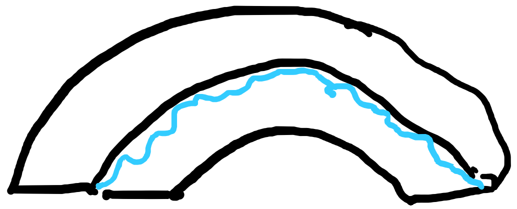
$$\frac{R_{xy}}{\frac{2}{3}\pi \frac{R^3_{test}}{h_{test}}} = \frac{R_z}{2\pi R^2_{test}}$$

iso 3)

$$\boxed{\frac{R_{xy}}{2\pi r_{st} h_{st}} = \frac{R_z}{\pi R^2_{st}}}$$

non giunge a convergenza

1) Ipotesi di isostrain non sono applicabili
interfaccia 1 c'è lo spostamento del centro di simmetria



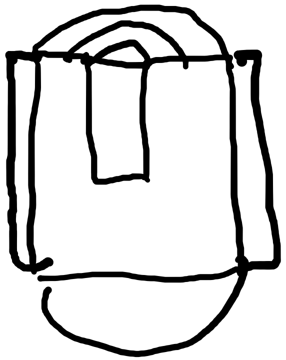
2) Se domina la torsione non è vera iso 3

aumenta la porosità osso

3) se domina il bending. non vi è distribuzione uniforme
della Rxy

1) Cambio materiale cotile. → $E_{cot} \gg$ maggiore.

2) Cambiare la copertura superficiale

3)  introduzione di staffe di fissaggio.