

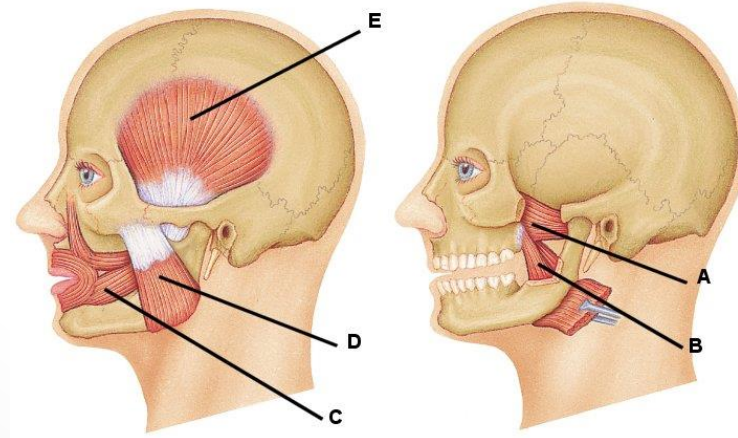


Etude morphométrique des déformations mandibulaires dans les plagiocéphalies sans synostose





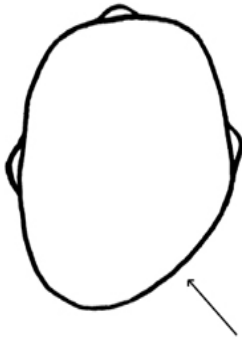
I - CONTEXTE MEDICAL



CONTEXTE MEDICAL

Les Plagiocéphalies sans Synostose (PSS)

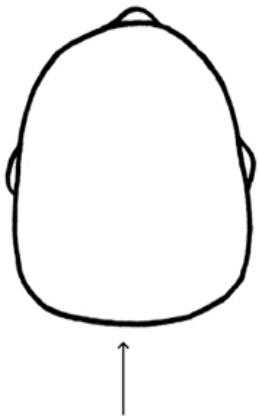
Plagiocéphalie occipitale



Plagiocéphalie fronto-occipitale



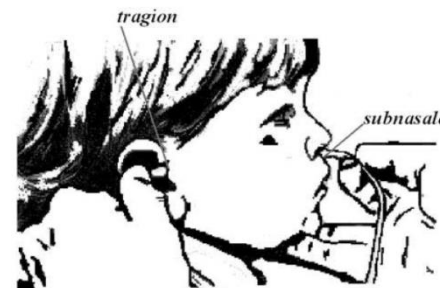
Platycéphalie



CONTEXTE MEDICAL

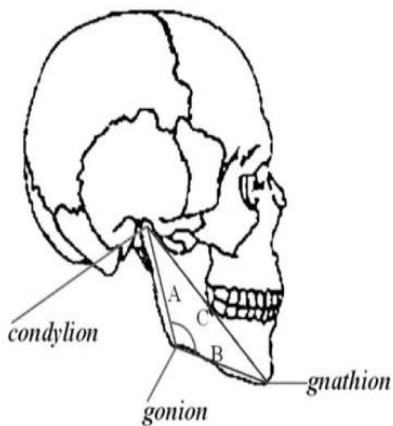
Les deformations mandibulaires

- Asymétrie physiologique
- Asymétrie pathologique



1. L'étude de D. St John (2002) sur les PO

- Asymétrie positionnelle
- Asymétrie intrinsèque



CONTEXTE MEDICAL

Les déformations mandibulaires

2. L'étude du Pr. Captier (2007) sur les PFO, PO et BP

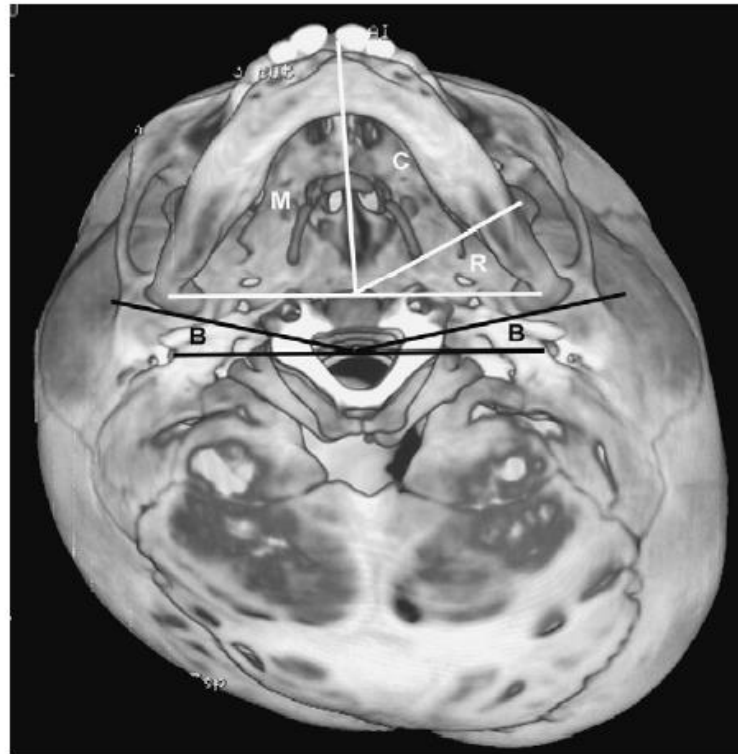
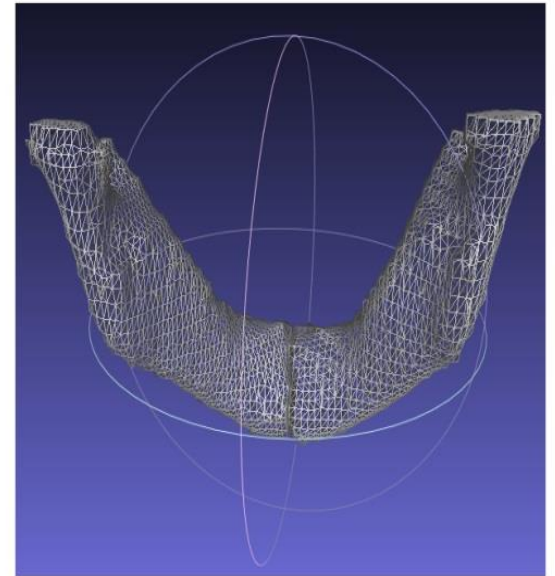
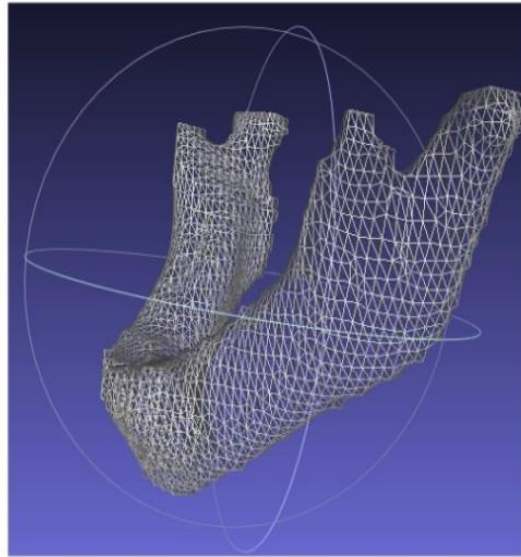
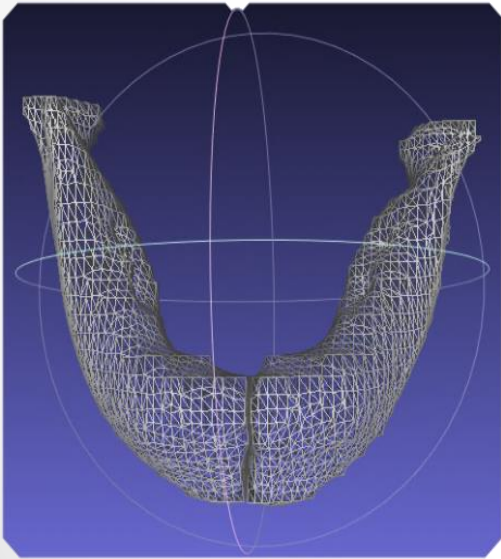


Figure 2. Vue inférieure du crâne montrant les différents angles mesurés : l'angle base du crâne-condyles mandibulaires (B), l'angle du ramus (R), l'angle du corpus (C) et l'angle hémimandibulaire (M).

II- MATERIEL ET METHODES



MATERIEL ET METHODES

Echantillon

Echantillon étudié	SAINS	PFO	PO	BP	TOTAL
0 à 3 ans	15	16	24	10	65
4 à 18 ans	8	11	0	2	21
Adultes	3	0	0	0	3
TOTAL	26	27	24	12	89

MATERIEL ET METHODES

Pipeline des logiciels

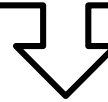
Segmentation des images de scanner

Myrian®



Recalage des héli-mandibules droite et gauche

Meshlab



Mesure de l'asymétrie

CloudCompare



ANALYSE STATISTIQUE

EXCEL



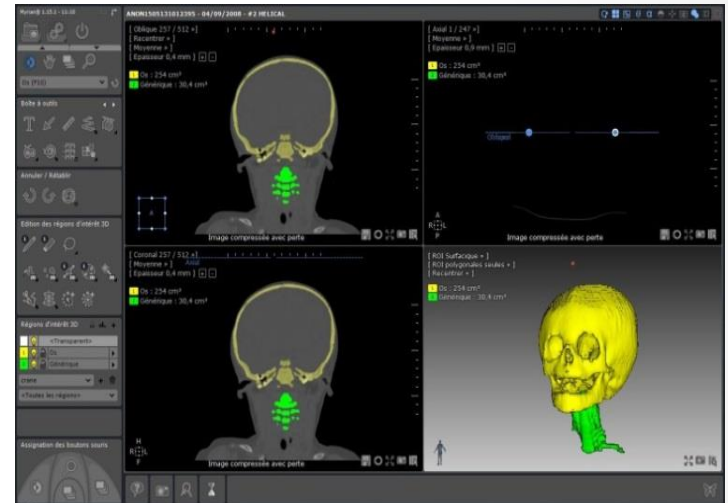
MATERIEL ET METHODES

La Segmentation



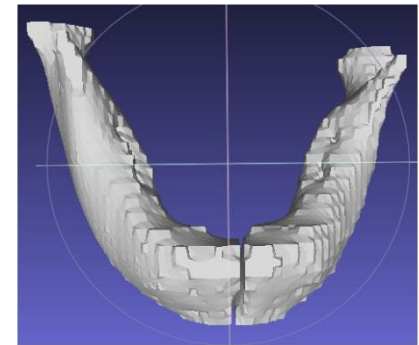
1. Segmentation cranio-mandibulaire

- Segmentation semi-automatique par seuillage
- Segmentation manuelle
 - Outil gomme
 - Outil pinceau



2. Segmentation h mi-mandibulaire

- Segmentation manuelle

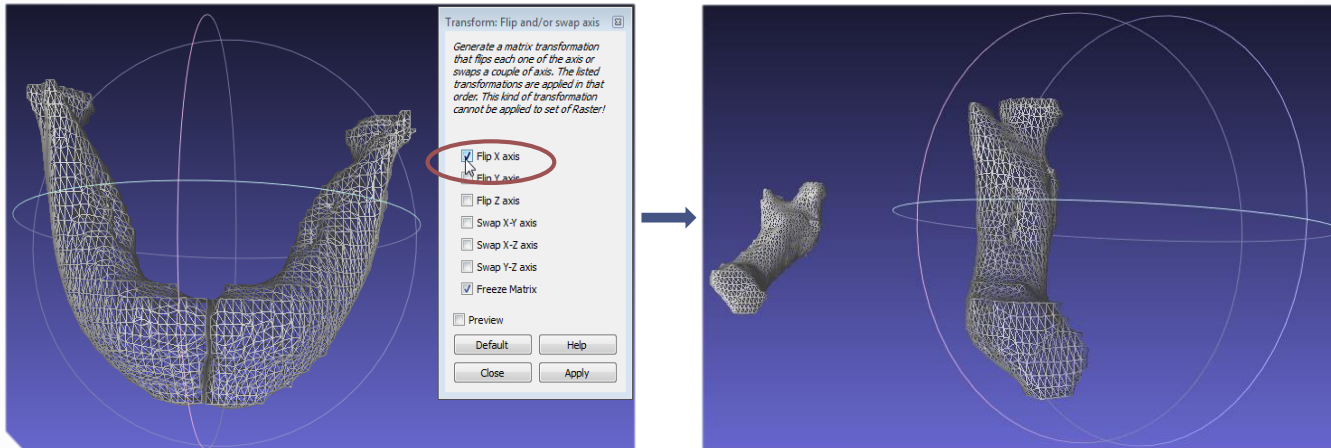


MATERIEL ET METHODES

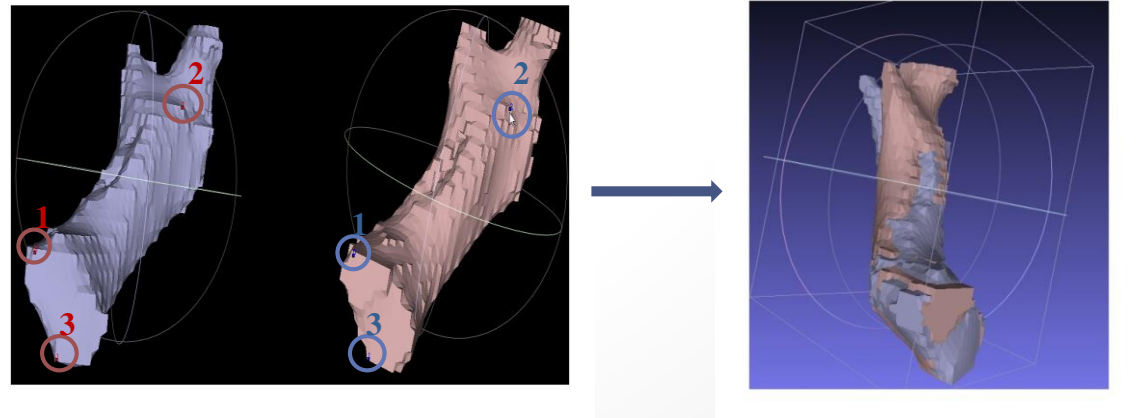
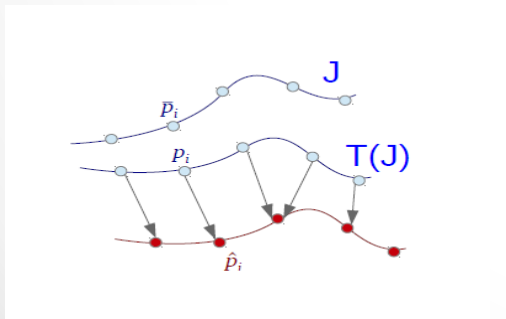
Le Recalage



1. Inversion en miroir de l'HMG

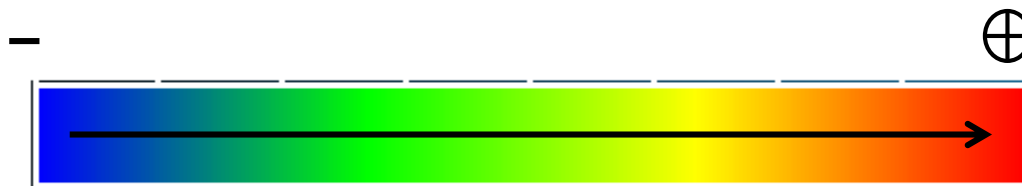
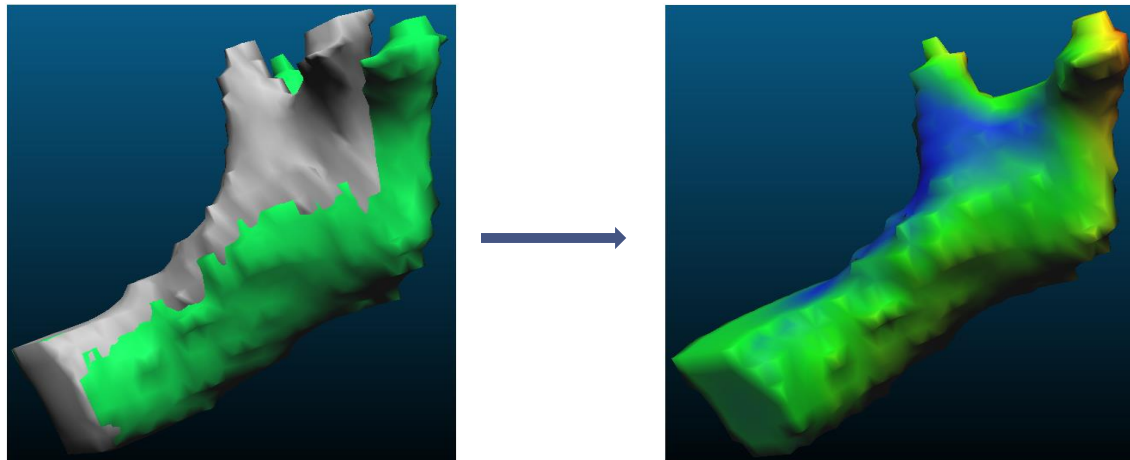
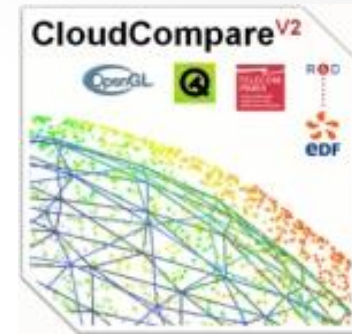


2. Recalage ICP



La Mesure de l'asymétrie

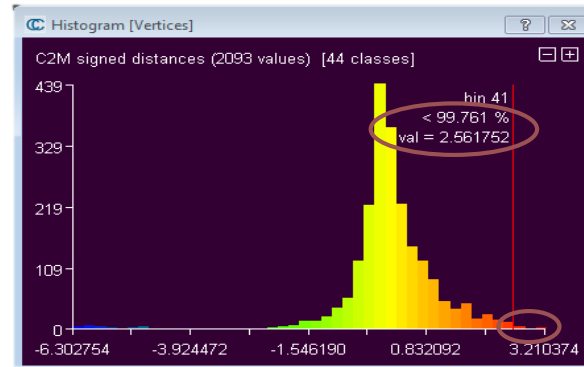
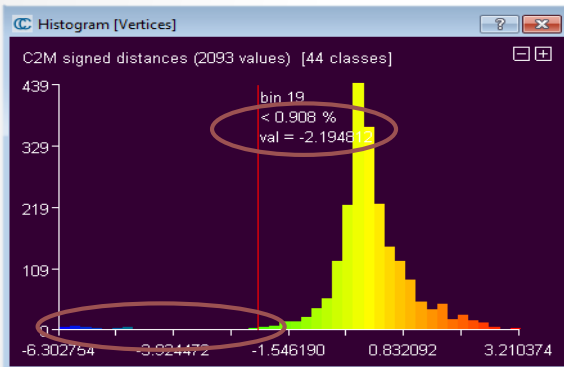
- Carte des distances



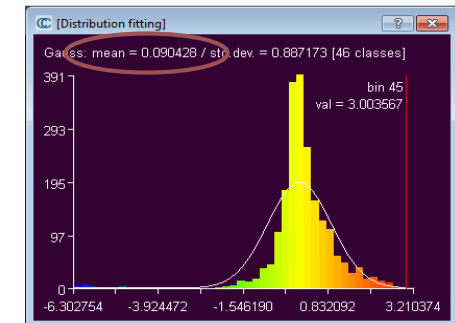
La Mesure de l'asymétrie

- Choix des variables aléatoires de l'asymétrie mandibulaire

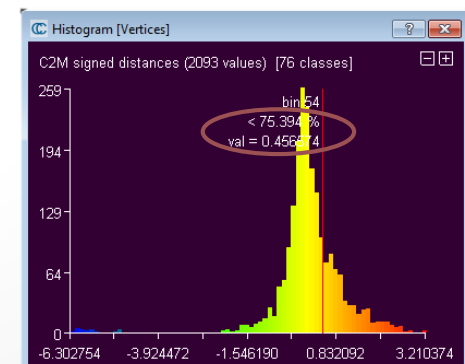
1. Maximum des distances (valeur absolue)



2. Moyenne des distances



3. 3^{ème} Quartile des distances



RESULTATS

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RESULTATS

Tableaux de données

- Tests de normalité

SAINS	Mandibule			Age (années)
	Max ajusté	Q3 ajusté	Moyenne ajustée	
ANON1505131007214	0.066	0.016	0.006	0.1
ANON1405131428220	0.078	0.017	0.002	0.1
ANON16051311392213	0.209	0.083	0.055	0.1
ANON1704130903508	0.133	0.031	0.010	0.3
ANON1704130858142	0.062	0.014	0.004	0.4
ANON1405131524245	0.105	0.009	0.004	0.4
ANON1405131506494	0.095	0.014	0.003	0.6
ANON16051311491014	0.094	0.022	0.009	0.8
ANON15051312220825	0.112	0.024	0.011	0.8
ANON1505131406420	0.105	0.018	0.003	1.0
ANON14051316094413	0.075	0.011	-0.001	1.0
ANON1505131034599	0.085	0.017	0.004	1.9
ANON16051312093316	0.098	0.017	0.004	2.1
ANON16051312170317	0.124	0.033	0.001	2.1
ANON15051310520011	0.097	0.019	0.004	2.4
ANON1505130943320	0.130	0.016	0.016	3.4
ANON15051315472611	0.092	0.024	0.009	5.7
ANON15051316241916	0.061	0.011	0.003	6.2
ANON15051315523912	0.108	0.024	0.007	6.9
ANON1505130924414	0.086	0.008	-0.004	10.1
ANON1908102055489	0.058	0.011	-0.002	13.1
ANON2703131221277	0.232	0.060	0.029	13.4
ANON02081120050910	0.116	0.022	0.003	13.7
ANON14051316514521	0.080	0.013	0.003	20.2
ANON14051316422619	0.103	0.017	0.003	31.5
ANON1605131429200	0.094	0.023	0.005	34.2
Moyenne	0.104	0.022	0.007	6.630
Variance	0.040	0.016	0.012	9.417

PFO	Mandibule			Crane	Age
	Max ajusté	Q3 ajusté	Moyenne ajustée		
ANON1605131019410	0.222	0.037	0.024	0.405	0.3
ANON1605131054145	0.239	0.041	0.026	0.315	0.4
ANON15051311270314	0.268	0.049	0.031	0.312	0.5
ANON1605130935137	0.128	0.027	0.011	0.182	0.5
ANON0208112004294	0.180	0.019	0.006	0.208	0.6
ANON16051311260710	0.181	0.030	0.014	0.254	0.7
ANON2204131513542	0.209	0.032	0.018	0.305	0.8
ANON1505131421053	0.259	0.034	0.023	0.245	0.8
ANON1605130945229	0.146	0.033	0.015	0.360	0.8
ANON15051316183515	0.213	0.044	0.024	0.294	0.8
ANON1405131555509	0.158	0.019	0.010	0.246	0.9
ANON1505131019576	0.287	0.035	0.024	0.372	1.0
ANON0208112004579	0.171	0.014	0.003	0.106	1.1
ANON15051312081023	0.142	0.026	0.006	0.120	1.1
ANON15051316102114	0.191	0.020	0.011	0.300	1.2
ANON02081120053714	0.115	0.025	0.009	0.413	1.9
ANON1605131025321	0.164	0.024	0.010	0.163	4.5
ANON1505131514498	0.194	0.039	0.021	0.109	4.7
ANON2204131520563	0.137	0.016	0.008	0.109	4.7
ANON26031311534412	0.201	0.021	0.005	0.121	4.7
ANON15051312144124	0.152	0.039	0.015		4.7
ANON2204131458500	0.149	0.022	0.008	0.184	4.9
ANON2304131518070	0.266	0.034	0.017	0.537	6.7
ANON02081120061926	0.105	0.015	0.004	0.164	8.9
ANON02081120091863	0.115	0.026	0.031	0.180	10.2
ANON1905131024225	0.128	0.010	0.000	0.085	15.0
ANON02081120084857	0.113	0.054	0.022	0.111	15.8
Moyenne	0.179	0.029	0.015	0.244	3.635
Variance	0.053	0.011	0.009	0.117	4.346

PO	Mandibule			Crane	Age
	Max ajusté	Q3 ajusté	Moyenne ajustée		
ANON15051311355915	0.228	0.016	0.009		0.0
ANON1704130859474	0.254	0.017	0.014	0.196	0.4
ANON1605131116028	0.180	0.024	0.011	0.234	0.4
ANON15051311124113	0.162	0.030	0.011	0.121	0.4
ANON15051311013912	0.169	0.029	0.017	0.188	0.5
ANON16051309523011	0.283	0.024	0.015	0.236	0.6
ANON17041309063911	0.121	0.013	0.006	0.101	0.6
ANON1605130847441	0.158	0.034	0.016	0.288	0.6
ANON1505131526169	0.204	0.022	0.013	0.200	0.7
ANON16051311300911	0.125	0.024	0.008	0.157	0.7
ANON1605130925156	0.290	0.035	0.023	0.289	0.7
ANON1605130906044	0.197	0.017	0.004	0.207	0.7
ANON15051316383718	0.123	0.016	0.001	0.140	0.7
ANON16051311105467	0.214	0.022	0.014	0.179	0.8
ANON1605131042074	0.143	0.018	0.006	0.294	0.8
ANON1605130920575	0.153	0.021	0.010	0.138	0.8
ANON1605130837340	0.149	0.022	0.009	0.274	0.8
ANON1505131431235	0.156	0.020	0.006	0.123	0.9
ANON15051312020921	0.133	0.023	0.010	0.235	1.0
ANON16051309595913	0.106	0.025	0.009	0.215	1.1
ANON1505130955512	0.239	0.028	0.021	0.274	1.3
ANON15051311562920	0.203	0.020	0.014	0.189	1.3
ANON16051309561512	0.150	0.025	0.009	0.101	1.4
ANON14051316222816	0.120	0.016	0.003	0.120	1.8

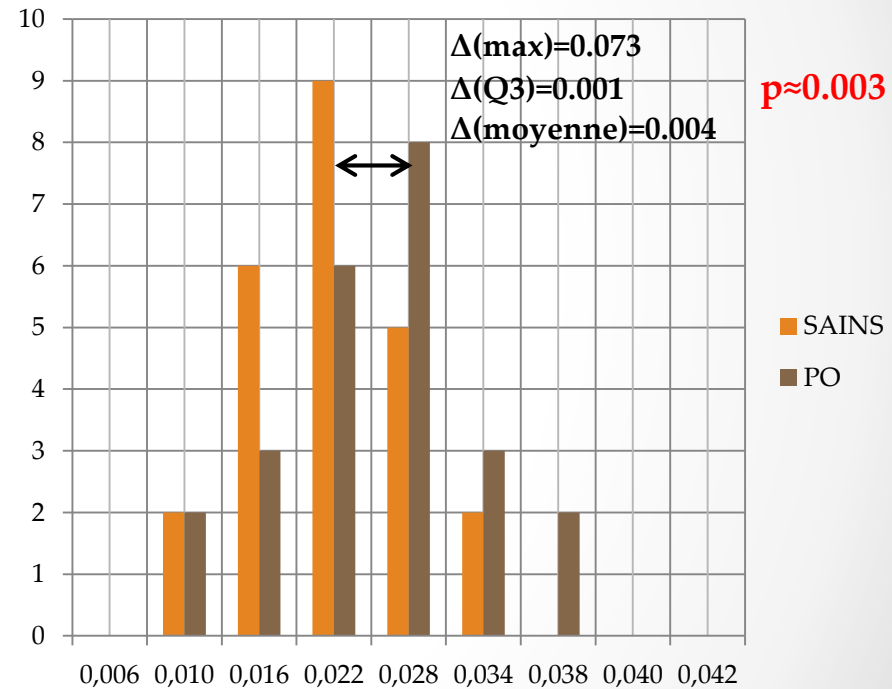
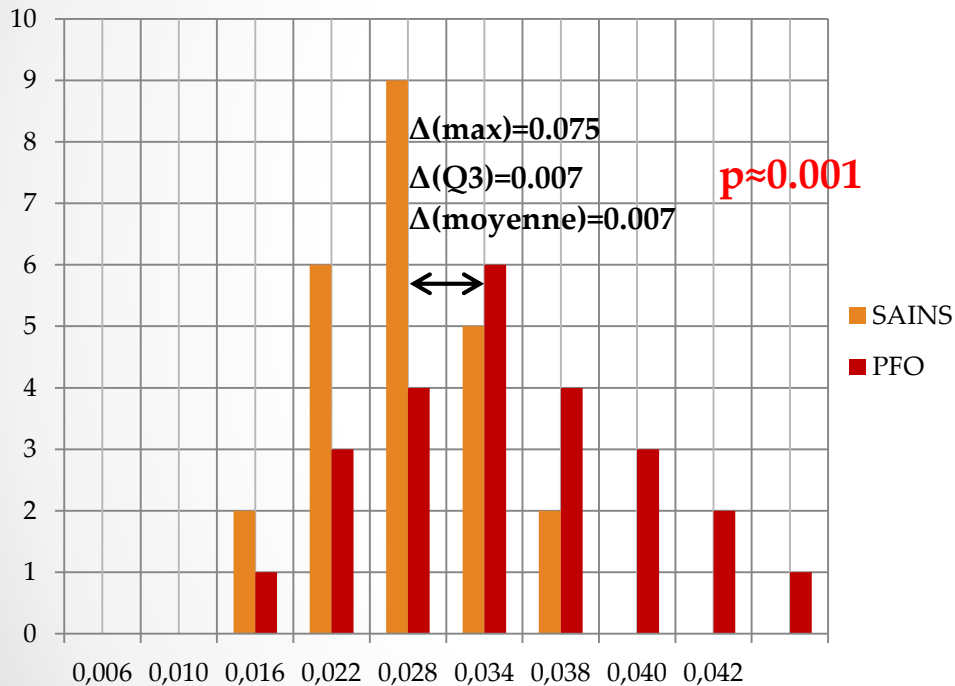
Moyenne	0.177	0.023	0.011	0.199	0.789
Variance	0.052	0.006	0.005	0.062	0.377

BP	Mandibule			Crane	Age
	Max ajusté	Q3 ajusté	Moyenne ajustée		
ANON1605131032072	0.179	0.029	0.011	0.182	0.5
ANON1605131037073	0.167	0.030	0.014	0.196	0.5
ANON0208112004496	0.120	0.013	0.004	0.138	0.6
ANON1505131012395	0.150	0.019	0.012	0.228	0.6
ANON1505131418072	0.176	0.023	0.011	0.150	0.7
ANON1505131029398	0.173	0.024	0.009	0.404	0.7
ANON1505131425464	0.148	0.040	0.021	0.169	0.7
ANON15051315354910	0.150	0.021	0.013	0.127	0.7
ANON1704130858001	0.154	0.019	0.009	0.085	0.8
ANON1605131121359	0.155	0.017	0.009	0.196	0.8
ANON1605130942178	0.068	0.007	-0.003	0.103	1.0
ANON15051311503519	0.108	0.011	0.002	0.156	1.1
Moyenne	0.146	0.021	0.009	0.179	0.718
Variance	0.032	0.009	0.006	0.082	0.190

RESULTATS

Tests de comparaison (Mann-Whitney $\alpha=0.1$)

1. Sains vs déformés

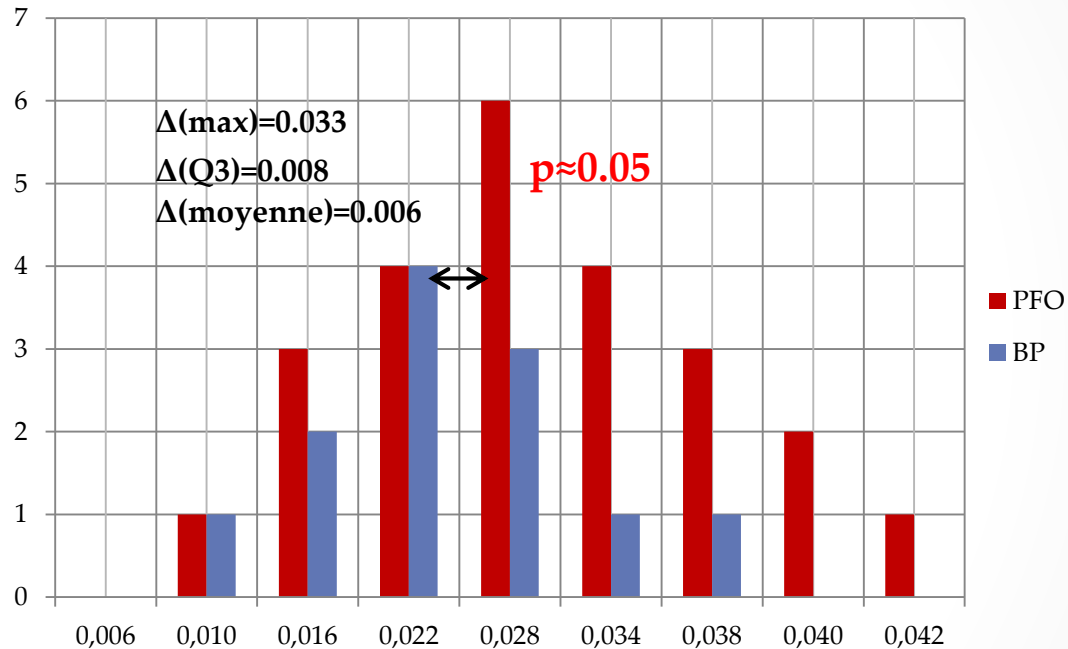


- Ambiguïté pour les **sains vs BP**: distributions Q3 pareils $p(Q3) > 0.3$

RESULTATS

Tests de comparaison (Mann-Whitney $\alpha=0.1$)

2. PFO vs BP

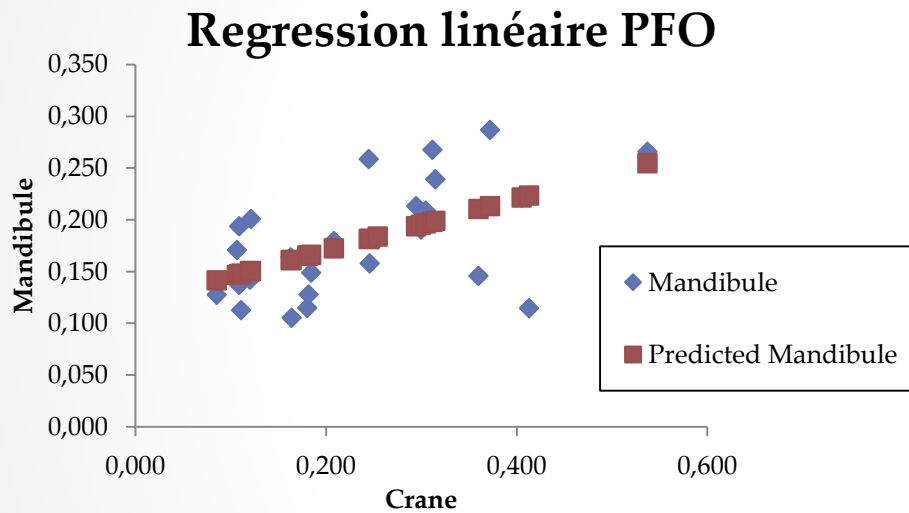


- Ambiguïté pour les **PFO vs PO** : dists moyenne et Q3 différents
- Ambiguïté pour les **PO vs BP** : dists maximums différents

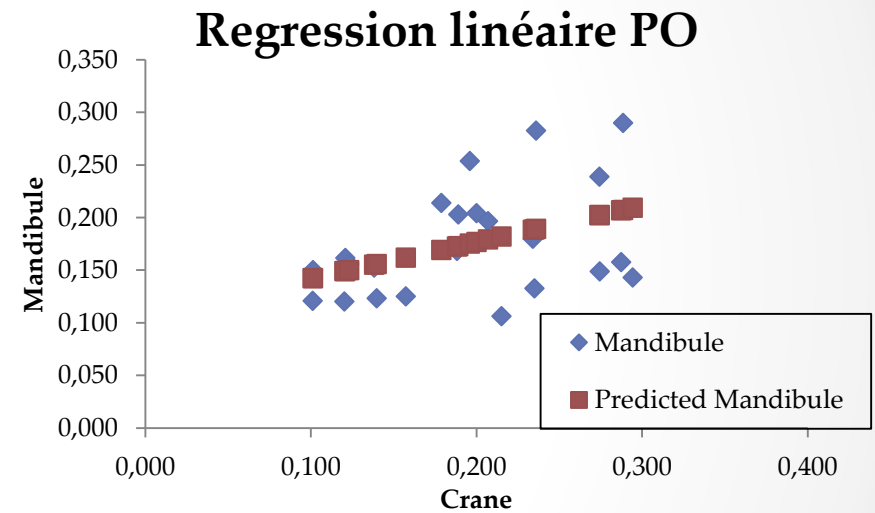
RESULTATS

Tests de corrélation (Spearman $\alpha=0.1$)

1. Corrélation asymétrie mandibulaire - asymétrie crânienne:



PFO : Coeff de corrélation= 0.51 $p<0.01$



PO : Coeff de corrélation = 0.37 $0.05<p<0.1$

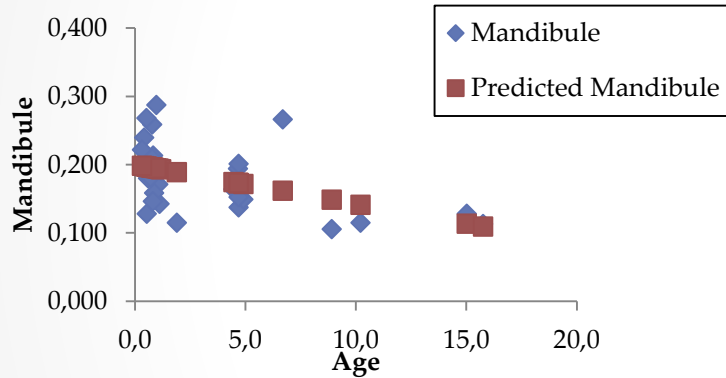
- Absence de corrélation mandibule-crane chez les BP ($0.1<p<0.2$)

RESULTATS

Tests de corrélation (Spearman alpha=0.1)

2. Corrélation asymétrie mandibulaire-age

Regression lineaire PFO

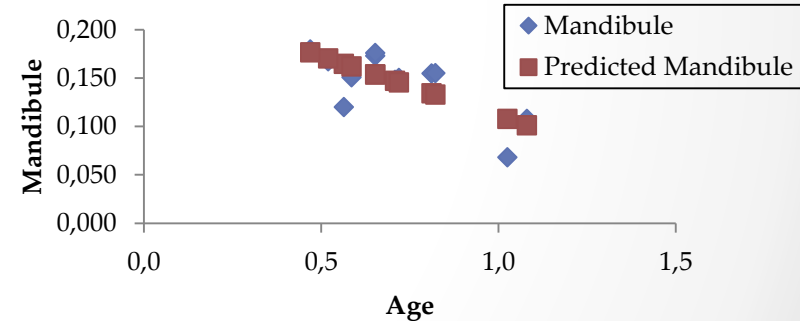


PFO :

Coeff de corrélation= - 0.53

p=0.005

Regression lineaire BP

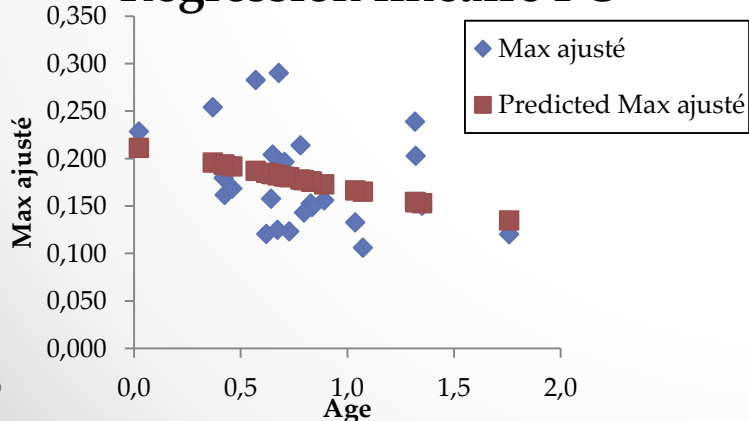


BP :

Coefficient de corrélation= -0.58

0.05<p<0.1

Regression lineaire PO



PO :

Coeff de corrélation= - 0.41

0.02<p<0.05

DISCUSSION

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DISCUSSION

- Asymétrie intrinsèque chez les PO corrélée à la déformation crânienne, comme chez les PFO
- Asymétrie intrinsèque chez les BP non corrélée à la déformation crânienne
 - Asymétrie sains=asymétrie BP ?
 - Asymétrie PFO>asymétrie BP
- Asymétrie intrinsèque Sains<BP<PO<PFO ?
- L'asymétrie mandibulaire intrinsèque diminue toujours avec l'âge => phénomène de compensation ?
Extrinsèque ou intrinsèque?