ANNALES
UNIVERSITATIS MARIAE CURIE-SKŁODOWSKA
LUBLIN – POLONIA
VOL. LXI, N 2, 202 SECTIO D 2006

Orthodontic Clinic in Ostrowiec Świętokrzyski, Chair and Department of General Chemistry
Chair and Department of Paedodontics, Medical University of Lublin

KATARZYNA KUCHARSKA, KAZIMIERZ PASTERNAK,
MARIA MIELNIK-BŁASZCZAK, DOROTA KRAWCZYK

Occlusal defects in patients seen for treatment at the Orthodontic Clinic in Ostrowiec Świętokrzyski

Occlusal defects often take the form of abnormal teeth positioning or improper bite relationship between both alveolar arches or between mandible and maxilla (9). Orthodontic treatment is not mandatory in cases of slight defects, which do not pose chewing difficulties and are acceptable (9).

Etiological factors responsible for occlusal defects are general endogenic (e.g. hereditary conditions, impaired endocrine secretion, systemic diseases), general exogenic (e.g. improper fetus position, mechanical pressure, avitaminosis, harmful side-effects of medications) or local (e.g. disfunction, parafunction, dental caries, traumatic injuries). The period of replacing deciduous dentition for permanent teeth is essential for developing occlusal defects. In that period clinical observation is easy and the normal course of development and elimination of exogenic pathological conditions ensure normal development of occlusal contact (4–12).

In addition to that, occlusal defects are related to improper articulation (1). Misalignment of teeth and abnormal alveolar arches make proper oral hygiene difficult and contribute to higher intensity of dental caries in that group of patients (2).

The purpose of the study was to analyze occlusal defects and frequency of wearing orthodontic appliances on daily basis among the patients seen at the Orthodontic Clinic in Ostrowiec Świętokrzyski.

MATERIAL AND METHODS

Medical documentation (filed over the year 2005) from the Orthodontic Clinic in Ostrowiec Świętokrzyski was studied . The clinic is the only one in the region that constructs orthodontic appliances within the National Health Fund (NHF) scheme. The care is provided for 1,134 patients, 6–13 years old, of whom 784 (69.14%) children are wearing removable orthodontic appliances and 350 (30.86%) are waiting for removable devices due to either final diagnosis that is missing or insufficient financial means from the NHF to cover the costs of the appliances for the year 2005. Among the orthodontic patients, 65% live in Ostrowiec Świętokrzyski, 35% come from adjacent small towns and communes.

RESULTS

The results presented in Table 1 show that the biggest group of patients seen at the clinic are 11-year-olds (31.57%), 12-year-old children are 21.43% and 10-year olds 16.23%. The smallest group are 6-year-olds (0.44%) and 7-year-olds (0.71%); 6.17% are 8-year-old children, 10.05% 9-year-olds and 13.4% are 13-year-old children.

Table 1. Number and percentage of patients seen at the orthodontic clinic with regard to age

Age (years)		13	12	11	10	9	8	7	6
Patients treated in the clinic 1,134	number	152	243	358	184	114	70	8	5
	%	13.40	21.43	31.57	16.23	10,05	6.17	0.71	0.44
Patients wearing orthodontic appliances 784	number	143	203	298	91	44	5	0	0
	%	18.24	25.89	38.01	11.61	5.61%	0.64	0	0
Patients waiting for orthodontic appliances 350	number	9	40	60	93	70	65	8	5
	%	2.57	11.43	17.14	26.57	20.00	18.57	2.29	1.43

Table 2 lists the results concerning the types of occlusal defects detected in the group of patients examined. Distoclusion was diagnosed in – 46.65% cases, transversal occlusion – 11.99%, crowding – 10.67%, mesioclusion – 9.26%, open bite – 6.0%, teeth abnormalities – 5.27%, deep bite – 3.97%, three dimensional disorders – 3.97% and bimaxillary protrusion – 2.03% cases.

Table 2. Number and percentage of occlusal defects detected in patients of the Orthodontic Clinic in Ostrowiec Świętokrzyski

Defect type	Patients with orthodontic appliance constructed 784		Patients waiting for orthodontic appliance 350		Total 1.134	
	number	%	number	%	number	%
Cross bite	94	11.99	42	12.00	136	11.99
Distoclusion	361	46.05	168	48.00	529	46.65
Mesioclusion	63	8.04	42	12.00	105	9.26
Crowding	94	11.99	27	7.71	121	10.67
Bimaxillary protrusion	16	2.04	7	2.00	23	2.03
Dental abnormalities	47	5.99	15	4.29	62	5.47
Deep bite	31	3.95	14	4.00	45	3.97
Open bite	47	5.99	21	6.00	68	6.00
Three-dimensional disorders	31	3.95	14	4.00	45	3.97

Table 3 presents statistical results of Chi^2 tests comparing the frequency of occlusal defects. The study verified the hypothesis of equal frequency of occlusal defects, i.e. assumed 50% : 50% both types of compared defects. The analysis confirmed that distocclusion was significantly more frequent among all types of defects detected. Transversal defects and crowding, dental abnormalities, open bite, deep bite and three-dimensional disorders occurred with similar frequency.

Table 3. Frequency of occlusal defects (Chi² and significance)

Defect type	1	2	3	4	5	6	7	8	9
Cross bite 1		232.254 p<0.001	3.988 p<0,05	0.875	80.308 p<0.001	27.657 p<0.001	45.751 p<0.001	22.667 p<0.001	45.751 p<0,001
Distoclusion 2	232.254 p<0.001		283.558 p<0.001	256.099 p<0.001	463.833 p<0.001	369.017 p<0.001	408.112 p<0.001	355,982 p<0,001	408.112 p<0.001
Mesioclusion 3	3,988 p<0.05	283.558 p<0.001		1.133	52.531 p<0.001	11.072 p<0.001	24.000 p<0.001	7.913 p<0.05	24.000 p<0.001
Crowding 4	0.875	256.099 p<0.001	1.133		66.694 p<0.001	19.022 p<0.001	34.795 p<0.001	14.862 p<0.001	34.795 p<0.001
Bimaxillary protrusion 5	80.308 p<0.001	463.833 p<0.001	52.531 p<0.001	66.694 p<0.001		17.894 p<0.001	7.11 p<0.01	22.253 p<0.001	7.11 p<0.01
Dental abnormalities 6	27,657 p<0.001	369.017 p<0.001	11.072 p<0.001	19.022 p<0,001	17.894 p<0.001		2.701	0.277	2.701
Deep bite 7	45,751 p<0.001	408.112 p<0.001	24.000 p<0.001	34.795 p<0.001	7.11 p<0.01	2.701		4.68 p<0.05	4.68 p<0.05
Open bite 8	22,667 p<0.001	355.982 p<0.001	7.913 p<0.05	14.862 p<0.001	22.253 p<0.001	0.277	4.68 p<0.05		0
Three-dimensional disorders 9	45.751 p<0.001	408.112 p<0.001	24.000 p<0.001	34.795 p<0.001	7,11 p<0.01	2.701	0	4.68 p<0.05	

Figure 1 presents data concerning regular wearing orthodontic appliances. The results reveal that only 20% patients (12% girls and 8% boys) wear his/her removable orthodontic appliance regularly, 75% patients (37% girls and 38% boys) do not wear it regularly and 5% patients (1% girls and 4% boys) do not wear it at all.

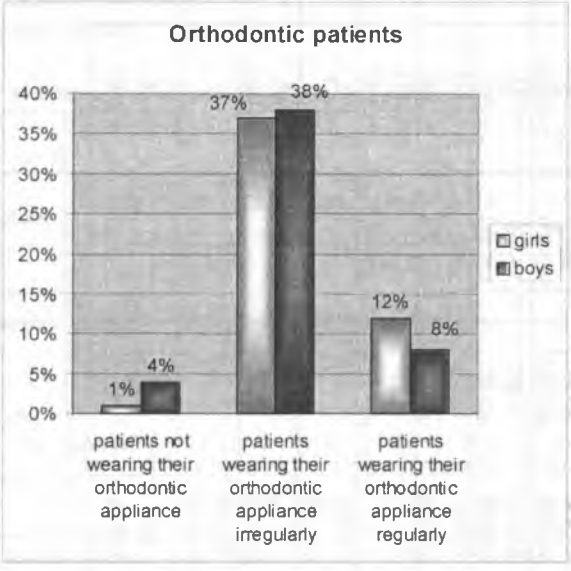

Table 4 presents the frequency of wearing orthodontic appliances by boys and girls. Basing on the data presented in Table 2 a significant correlation between wearing orthodontic appliance and gender was established ($Chi^2 = 19.7940$; $p = 0.00005$). Girls regularly wear their orthodontic appliances more frequently 23.98% (of all girls examined) in comparison to boys 16.07% (of all boys examined). The frequencies of irregular wearing orthodontic appliances were close: 73.98% girls (of all girls examined) and 76.02% boys (of all boys examined). The analysis of the number and percentage of patients not wearing orthodontic appliances revealed that boys more often than girls did not wear orthodontic appliances: 7.91% boys (of all the boys examined) and 2.04% girls (of all the girls examined).

Table 4. Frequency of orthodontic appliance regularly worn by girls and boys

	Pearson's Chi^2: 19.7940, df=2, p=0.000050			
	Orthodontic appliance wearing	Girls	Boys	Total
Number	does not	8	31	39
% column		2.04%	7.91%	
Number	wears irregularly	290	298	588
% column		73.98%	76.02%	
Number	wears regularly	94	63	157
% column		23.98%	16.07%	
Number	whole group	392	392	784

DISCUSSION

The results of our study referred to overall data obtained countrywide in the group of 12-year olds (3). The comparison found that overjet was the most frequent defect detected in 47% children from Ostrowiec Świętokrzyski; the overall country results revealed the defect in 20.8% children. Our study found that deficient space was observed in 12% children, lateral cross bite in 3%, excessive space for a tooth in 8% cases, reversed overjet in 8%, open overjet in 6%, deep overbite in 4%, lateral overlinguaocclusion in 2% children. Country overall data revealed 25.3%, 11.1%, 7.1%, 3%, 6.8%, 14.2% and 3.6% children respectively. We also observed overnumber as well as undernumber of teeth in 0.5% children compared to overall data (0.7%). Narrowed gap after M1 from the back was observed in 2% of the children examined, narrowed gap after M2 from the front in 1% of the children in comparison to country overall data: 2.5% and 1.1% children respectively.

CONCLUSIONS

1. Distoclusion was the most frequent defect determined among the children examined.
2. Orthodontic appliances are worn by a small group of patients.
3. Regular wearing of orthodontic appliances is more frequent among girls.

REFERENCES

1. Guza-Klemm I. et al.: Wady zgryzu, a wady wymowy – współpraca stomatologa z logopedą. Mag. Stomat., 142, 9,30, 2003.
2. Jańczuk Z.: Profilaktyka profesjonalna w stomatologii. PZWL, Warszawa 2001.
3. Jańczuk Z., Ciągło A.: Podstawy epidemiologii chorób narządu żucia. Centrum Edukacji Medycznej, Warszawa 1999.
4. Masztalerz A.: Zmiany rozwojowe zgryzu – fakty i mity. Mag. Stomat., 142, 9, 10, 2003.
5. Masztalerz A.: Stłoczenia zębów – problem nie tylko ortodontyczny. Mag. Stomat., 5, 1, 17, 1995.
6. Mielnik-Błaszczak M. et al.: Ocena stanu uzębienia oraz potrzeb leczniczych w zakresie zabezpieczenia protetyczno-ortodontycznego po przedwczesnej utracie zębów mlecznych u dzieci w wieku 7–9 lat ze szkoły wiejskiej. TMM-Forum. Stomat., 4, 50, 2003.
7. Remiszewski A. et al.: Warunki zgryzowe i stan stawu skoroniowo-żuchwowego u dzieci 7- i 12-letnich. Stom. Współcz., 3, 1, 49, 1996.
8. Skomro P., Ziemba Z.: Stan zgryzu i potrzeby w zakresie leczenia ortodontycznego u dzieci jednej ze szkół podstawowych Szczecina. Czas. Stom., 51, 4, 277, 1998.
9. Szponar-Żurawska A.: Nawyk wciągania dolnej wargi pod górne zęby sieczne jako przyczyna tyłozgryzu i brodawczaków wargi. Czas. Stom., 40, 8, 10, 1995.
10. Śmiech-Słomkowska G.: Elementy wczesnego rozpoznawania nieprawidłowości zębowych w stomatologicznej praktyce ogólnej, e-Dentico, 3, 36, 2004.
11. Zadurska M. et. al.: Hipodoncja – etiologia na podstawie piśmiennictwa. Czas. Stom., 52, 2, 130, 1999.
12. Żyśko-Christ D.: Ocena stanu jamy ustnej dzieci 7–12 i 14-letnich w Szkole Podstawowej nr 2 w Grudziądzu. Mag. Stomat., 5, 24, 2001.

SUMMARY

The purpose of the study was to analyze occlusal defects and frequency of wearing orthodontic appliances on daily basis among the patients seen at the Orthodontic Clinic in Ostrowiec Świętokrzyski. The material analyzed was medical documentation of 2005 filed at the Orthodontic Clinic in Ostrowiec Świętokrzyski. The clinic is the only one in the region that constructs orthodontic appliances refunded by the National Health Fund. Orthodontic care is provided for 1,134 children, 6–13 years old, of whom 784 (69.14%) children are wearing removable orthodontic devices and 350 (30.86%) are waiting to have them constructed. The analysis found that distoclusion was the most frequently type of occlusal defects affecting 46.65% patients and that regular wearing of orthodontic appliances is significantly more frequent among girls.

Analiza wad zgryzu u pacjentów zgłaszających się do Poradni Ortodontycznej w Ostrowcu Świętokrzyskim

Celem pracy była analiza wad zgryzu i regularności noszenia aparatu ortodontycznego, przeprowadzona wśród pacjentów Poradni Ortodontycznej w Ostrowcu Świętokrzyskim. Analizie poddano dokumentację medyczną z roku 2005 Poradni Ortodontycznej w Ostrowcu Świętokrzyskim, która jest jedyną tego typu placówką w powiecie, wykonującą aparaty ortodontyczne w ramach refundacji z NFZ. Opieką ortodontyczną w poradni objętych jest 1134 dzieci w wieku 6–13 lat, z czego 784 (69,14%) dzieci nosi aparaty ruchome, a 350 (30,86%) dzieci oczekuje na ich wykonanie. Na podstawie przeprowadzonej analizy stwierdzono, że najczęściej u badanych dzieci występowały wady dotylne (u 46,65%), a istotnie częściej wykonany aparat ortodontyczny nosiły regularnie dziewczęta.