



The influence of individual's swallowing disorders on their functioning in the family and society. The importance of neurologopedic diagnostics. Preliminary research release

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During my neurologopedic work with patients, I often encounter problems with swallowing that coexist with other disorders associated with neurodegenerative and cardiovascular diseases.

This article is an introductory report on the research on the impact of swallowing disorders on the functioning of individuals in the family and society. The described case study concerns a patient with additional health conditions, in whom swallowing disorders (dysphagia) are a consequence of damage to the Central Nervous System (CNS), more specifically cerebrovascular diseases. The article was written on the basis of medical documentation kept from the beginning of the disease, consultations with specialists, as well as an interview with the patient's family. A key role was also played by neurologopedic diagnosis and subsequent research conducted during the therapy, which allowed for the proper selection of therapeutic agents, proved the efficiency of the therapy, both in the neurological and social sphere.

KEY WORDS: disease, neurologopedic diagnosis, dysphagia, family, psychosocial functioning, swallowing.

The concept of swallowing disorders (dysphagia) in the theoretical perspective

Swallowing is a process involving the mouth, throat and esophagus. *The cortical representation of swallowing is attributed to the fronto-parietal lid. The dopamine part of the limbic system plays a modulating role*¹. In this complicated act, three phases can be distinguished: oral (which is arbitrary), pharyngeal and esophageal (both of which are reflex).

Phase I of swallowing (oral phase) lasts about 30 seconds and is conscious – controlled by the motor cortex. It consists of two stages – during the first stage: the preparatory stage, the food is chewed, crushed, mixed with saliva and formed into a bolus. For the proper course of this process, the efficiency and coordination of lip tightness, circular and lateral movements of the mandible, proper cheek muscle tone and tongue movements on many levels are necessary. The second stage is the proper oral phase, which consists in shifting the bite back (towards the isthmus of the throat), thanks to the work of the muscles of the tongue and cheeks.

The second phase of swallowing (pharyngeal phase) lasts about 1-3 seconds and is an involuntary reflex, triggered by the irritation by the bite of the receptors in the soft palate, palatine arches, the base of the tongue and pharynx. Then, the contraction of the circular muscles of the pharyngeal sphincters provokes the formation of a peristaltic wave causing the food bite to shift through the throat cavity down to the esophagus. The nasal cavity is then closed by lifting the soft palate that separates the pharyngeal cavity from the nasal cavity, there occurs a contraction of the laryngeal muscles (laryngeal occlusion) closing the vocal gap, and lifting of the hyoid-laryngeal complex, which prevents the bite from falling into the respiratory tract. This phase ends with the closure of the upper esophageal sphincter, downward displacement of the larynx, widening of the glottis and opening of the pharyngeal segment.

¹ Obrębowski A., Wiskirska-Woźnica B., Obrębowska Z., *Zaburzenia połykania w praktyce neurologopedycznej* [in:], *Wprowadzenie do neurologopedii*, Poznań 2012, p. 370.

Phase III of swallowing (esophageal phase) lasts about 4-10 seconds and involves the movement of the bite into the stomach. It begins with the opening of the upper esophageal sphincter. Solid foods then move slowly (thanks to the peristaltic movement of the esophagus walls), while fluids quickly pour directly from the throat into the lower esophagus. When the peristaltic wave approaches the inlet, its relaxation takes place, allowing the bite to enter the stomach².

Normal oral and pharyngeal swallowing is quick and safe, with very few rare episodes of aspiration (food entering the airways), even in the elderly. The bite is usually swallowed efficiently with minimal food particles remaining in the mouth and throat³.

The sites that trigger the swallowing reflex are, first of all, the palato-lingual arches, as well as *the base of the tongue, lingual-epiglottis, the posterior wall of the pharynx, epiglottis, and pharyngeal junctions; with age, the swallowing-inducing zone moves backwards⁴.*

However, as a result of neurological and cardiac-related diseases, there are observed deviations from normal movements, difficulties in the act of swallowing⁵ called "dysphagia".

Dysphagia is a disorder that affects the ingestion and passage of food from the mouth to the throat and esophagus and it is associated with discomfort in swallowing⁶.

² Speech therapy concerns two initial stages of swallowing.

³ Logemann A. Jeri, *Evaluation and Treatment of Swallowing Disorders* [in:] *Folia Phoniatria Logopedica*, 47, 3, 1995, p. 140-164.

⁴ Logemann A. Jeri, Pauloski B. R., Rademaker A.W., Kahrilas J., *Oropharyngeal swallow in younger and older women: videofluoroscopic analysis.*, Chicago 2002, p. 434-445.

⁵ Wojtczak A., *Choroby wewnętrzne*, vol. 2, Warsaw 1995, p. 167.

⁶ Wiskirska-Woźnica B., Proszkiewicz A., Walczak M., *Zaburzenia połykania - postępowanie diagnostyczne i zasady rehabilitacji*, [in:] *Przewodnik lekarski*, Poznań 2002, p. 102-104.

Dysphagia is the opposite of the globus hystericus symptom (sensation of a foreign body in the neck) in which, unlike in dysphagia, swallowing food provides relief⁷.

Swallowing disorders may be caused by damage to the CNS⁸ or the structures of the oral cavity.

The most common causes of dysphagia due to CNS damage are vascular complications in the form of acute cerebral ischemia, embolism, and hemorrhagic lesions, where dysphagia may be of cortical, subcortical or bulbar origin. Other common causes are brain tumors and traumatic lesions⁹.

Depending on the etiology of the disease, the diagnosis of dysphagia is performed by a number of specialists: radiologists, gastrologists, neurologists, and ENT specialists. During the therapy process, a neurologist, physiotherapist, dietician and a neurologopedist work together.

Depending on the location of the difficulties, there are two types of dysphagia.

The first, upper (called pre-esophageal) phase, which includes the oropharyngeal phases, results in the loss of the ability to form a bolus and move it towards the throat, which leads to food remaining¹⁰ in the mouth. It is 80% the result of neuromuscular disorders¹¹.

⁷ Rosien U., Andersen V., Layer P., *Objawy gastroenterologiczne i ich leczenie. Dysfagia.*, Warsaw 2010, p. 135.

⁸ Examples include: stroke (80%), craniocerebral trauma (70%), brainstem lesions (60%), myasthenia gravis (17-53%), extrapyramidal syndromes (e.g. Parkinson's disease - 50%), amyotrophic lateral sclerosis (48-100%), neuromuscular diseases (85%), long-term hypoxia (80%), muscular dystrophy (70%) - data collected on the basis of Prosiegel M., *Praxisleitfaden Dysphagie*, Hamburg 2002, pp. 235.

⁹ Waśko-Czopnik D., Paradowski L., *Dysphagia in clinical practice*, Warsaw 1999, p. 33.

¹⁰ Retention is the presence of food remains in the cheeks, preglottic fossils, and the posterior commissure area or on the throat wall. The reasons for the retention may be weakness of the cheek muscles, tongue, reduced lifting of the larynx during swallowing, reduced pressure on the bite during transport, weakness of the muscles of the throat wall, or impaired sensation in the oral cavity.

¹¹ The data comes from research by Halama A.R., *Kliniczne podejście otolaryngologa do chorego z dysfagią*, [in:] *Otolaryngologia Polska*, vol. XLIX, Warsaw 1995, p. 29-36.

If the disorders involve the oral phase, there is leakage of saliva or food from the mouth, retention of food or saliva in the mouth, or both¹².

Oral swallowing disorders may also include:

- flow of food due to insufficient closure of the mouth,
- inability to form a bite due to incorrect (limited) tongue movements or lack of tongue coordination,
- the inability to move the bolus deep into the mouth, which may be due to restriction of tongue movement,
- falling food into the vestibule of the oral cavity and its retention there due to the reduced tension of the red zone of the lip,
- falling food into the vestibule of the cheeks and retention due to the reduced tone of the cheek muscles,
- searching movements or lack of tongue coordination due to apraxia,
- delayed start of the oral phase due to apraxia or decreased oral sensation,
- premature tongue movements in the initial stage of swallowing ("pushing out" of the tongue"),
- food retention on the tongue (caused by limited movement or excessive tension),
- tongue peristalsis disorder,
- limited ability to upright the tongue, causing incomplete contact between the tongue and the palate, food stagnation on the hard palate,
- anterior-posterior tongue coordination disorders,
- uncontrolled, too early displacement of the bolus or fluid to the throat (caused by reduced or lifted glosso-palatal occlusion),
- swallowing in small portions.

Disorders in the pharyngeal phase include the following:

- delayed swallowing through the throat,
- extended transport time of the bite in the throat area,

¹² Terlikiewicz J., Makarewicz R., *Zaburzenia połykania*. Bydgoszcz 2003, p. 32.

- regurgitation – that is, penetration into the nose as a result of a weakened palatopharyngeal closure, through which food, saliva and secretions enter the nasal cavity,
- limited movement of the base of the tongue causing food retention,
- weakening of throat muscle spasm resulting in obstruction of the throat walls after swallowing,
- insufficient elevation of the larynx, and thus retention at the beginning of the respiratory tract,
- penetration – entry of saliva, secretions, food or fluid into the larynx,
- aspiration – saliva, secretions, food or fluid getting into the respiratory tract below the level of the vocal folds (into the trachea)¹³.

The second type of dysphagia is lower dysphagia – related to disorders in the third phase of swallowing – the esophageal phase. It manifests itself in problems with moving a food bite (or fluid) through the lower part of the larynx. It is accompanied by coughing, choking, gagging, or regurgitation of food through the nose, leading to choking. 85% of swallowing impairments at this level is associated with structural disorders and only 15% with motor disorders.¹⁴

*The patient complains (then MZ) about the feeling of conscious sensation of movement of the food or even getting stuck with solid, possibly also liquid food ingredients.*¹⁵

Another division of dysphagia includes:

- oropharyngeal dysphagia, in which the movement of the food bite is disturbed by the lack of coordination of the oropharyngeal phases,

¹³ Developed based on: Czernuszenko A. *Główne objawy dysfagii w badaniach instrumentalnych*, Warsaw 2013, p. 2-3.

¹⁴ Halama A.R., *Kliniczne podejście otolaryngologa do chorego z dysfagią*, p. 29-36.

¹⁵ Rosien U., Andersen V., Layer P., *Objawy gastroenterologiczne i ich leczenie. Dysfagia*, [in]: *Gastroenterologia praktyczna* Volume I, Wrocław 2013, p. 135.

- mechanical dysphagia in which there is an organic obstacle in the mouth, throat or esophagus,
- functional dysphagia, occurring in the course of neuroses or diseases without an organic basis,
- odynophagia- painful swallowing, disrupting the oral, pharyngeal and esophageal phases¹⁶.

Diagnosics of dysphagia from the medical perspective

Diagnosics of dysphagia begins with a thorough interview with the Patient, his or her family and the community in which he or she functions, concerning the symptoms, intensity and duration of occurrence, allowing to assess the location, phase and severity of the disorder, as well as its impact on psychosocial functioning (also in the smallest social cell, i.e. family). The efficiency of lifting the larynx with the hyoid bone is assessed by palpation. The diagnostics also includes the sensitivity of the oral mucosa, sensitivity to touch, and the presence of cough and throat reflexes. In addition, a physical examination, as well as radiological and endoscopic examinations are also performed. Sometimes it is also recommended to extend the diagnostics to include ultrasound, computed tomography, magnetic resonance and endoscopic ultrasound.

The Swallowing Rating Society recommended by the American Speech-Language-Hearing Society¹⁷ turns out to be extremely valuable in the diagnosis of dysphagia. Additionally, in diagnosing very helpful are the Dysphagia Assessment Scale and the Endoscopic Classification of Neurogenic Dysphagia (according to Warnecki 2013)¹⁸ which is as follows:

¹⁶ Developed based on the article Terlikiewicz J., Makarewicz R., *Zaburzenia połykania*, Bydgoszcz 2003, p. 31.

¹⁷ The scale is available on the website of the American Speech -Language-Hearing Society (March 13, 2020).

¹⁸ The given classification was developed in Poland by Dr. Anna Czernuszenko, MD, PhD.

- 0- absent clinically significant neurogenic dysphagia
- 1- mild neurogenic dysphagia (accompanied by significant leaking¹⁹ and/or retention without aspiration)
- 2- moderate neurogenic dysphagia: penetration/aspiration of one food consistency
- 3- severe neurogenic dysphagia: penetration of two or more food consistencies

As swallowing disorders affect the patient's self-esteem and very often hinder his psychosocial functioning, and reduce self-esteem and comfort of life before starting neurologopedic therapy, it is also justified to include the MDADI questionnaire (MD Anderson Dysphagia Inventory) in the examinations, thanks to which it is possible to distinguish, analyse, and then counteracting the main factors influencing the quality of life. The questionnaire consists of 20 questions, divided into four groups:

- I. Overall assessment of the problem of dysphagia – question: 1
- II. Emotional disorder related to difficulties in intake of food – questions: 2, 5, 6, 8, 12, 18
- III. Disorders of functioning in the family and society – questions: 3, 9, 14, 15, 20
- IV. Functional effects of dysphagia – questions: 4, 7, 10, 11, 13, 16, 17, 19

The patient chooses one of the five possible answers, scored according to the following scale: definitely yes- 1, yes- 2, no opinion- 3, no- 4, definitely not – 5²⁰.

¹⁹ Leaking is the uncontrolled leakage of food from the mouth or towards the throat. The reasons for this may be impaired work of the facial muscles, sensory disturbances in the oral cavity, disturbed bite control, delayed swallowing reflex. The leakage usually results in aspiration.

²⁰ The MDADI questionnaire is used for self-assessment of dysphagia and is an effective method of subjective monitoring of the development of dysphagia. It enables early diagnosis and counteracting some factors that reduce the quality of life in patients with swallowing disorders.

The results are given in a numerical scale from 0 (when the quality of life was assessed as completely unacceptable by the patient) to 100 (when the respondent assessed his quality of life as excellent)²¹.

Case study. Mr. Bartosz

Medical history of the patient and his family

The patient's family medical history shows that the pregnancy and childbirth proceeded correctly, and the child developed according to the standard in the first months of life. Around the age of 2, the patient began to have a somatic disease – Schönlein-Henoch disease was diagnosed, the symptoms of which recurred several times. At 9 years of age, the patient underwent surgery for a cerebellar tumour (medulloblastoma), followed by chemotherapy and cobalt therapy. After the surgery, according to mother's report, epileptic seizures began to appear, and therefore the patient is taking anti-epileptic drugs. Mother also mentioned the history of arterial hypertension I10, nicotinism Z72.0 and impaired glucose tolerance R73.0. Since childhood, the patient is under the care of Cardiology, Diabetes, Neurosurgery and Neurology Outpatient Clinics.

Bartosz's problems with swallowing began even before the last episode related to the stroke of the brainstem and cerebellum. According to mother's statement, the situation of stomach rumbling, choking and coughing up is not very comfortable for the son and causes him to be shy, causes difficulties in making new friendships and gradual withdrawal from already established relationships.

According to mother's statement, Bartosz is a calm person, a family man, who likes reading books and escaping into the world of plot. He is interested in history and floristry. He also attended

²¹ Detailed guidelines for the use of the MDADI test are provided in the article by Stręk P., Gawlik J., Składzień J. and others, *Ankietowa samoocena zaburzeń połykania i jakości życia u chorych leczonych z powodu nowotworów głowy i szyi*, [in:] *Otolaryngologia*, Warsaw 2003, 2(3), 120-125.

occupational therapy workshops, graduated from vocational school and acquired the profession of a tailor. Bartosz is also very helpful – he likes household chores and helps with gardening. He feels good among people he knows, e.g. family and friends. He is strongly connected with his mother, who quit her job and took care of her son. The information collected in the interview leads to the conclusion that the situation of the disease leads to a change in the functioning of the entire family and causes the need to change the lifestyle of all its members.

The interview with the patient shows that he is aware of his difficulties with swallowing – but he cannot name the disorder. He can determine exactly at which stage of the swallowing process he feels difficulties and what they consist of (pressure, a feeling of “rebound”, choking). The patient also has gag reflexes and digesta is returned through the nose, leading to gasp. It can be seen that this type of situations embarrass the patient, he often apologizes for the situation (when he happens to cough up saliva). He also says that he senses the difficulties in the work of the tongue that he has while eating and speaking – according to his account, his tongue is “lifeless”.

Bartosz was able to give the reason for his stay in the hospital, he also tells about the surgery he underwent in his childhood. During subsequent meetings, he lively discusses his interests and passions. One of them is gardening. He has trouble in listing the plants (flowers, fruits and vegetables in his garden) and the activities the gardener performs. He is very fond of his family – the relationship with his mother is especially important to him. Despite the speech disorders that were noticeable in the conversation, the dialogue with the patient made it possible to conduct an interview and a neurologopedic examination.

Neurologopedic examination

Neurologopedic examination was performed both at the beginning of therapy and at the end of treatment (after 8 weeks). After admission to the department, the patient’s mental condition was

satisfactory – awareness was clear, orientation (including space and time orientation) was full. Spontanic contact – the patient answers asked questions fully, to the point but slowly.

Articulation

Speech disorders concerning both understanding (to a lesser extent) and conveying messages are visible. Spontaneous speech is slow, at times poorly communicative, devoid of fluency and rhythm, scanned, loud, irregular, sometimes explosive. It is certainly influenced by Bartosz's hearing impairment and the lack of a hearing aid²².

There is also a lack of logical intonation (matched to the convey message) – the intonation of the sentence was standardized. Some words, or whole parts of a sentence, were overstressed (and therefore inadequately), and the scanning speech appeared several times. Excessive breaks in articulation between individual words can also be observed – the fluency and pace of speech were disturbed.

Muscle tone

The posture of Bartosz's body is also important, as he slouches down on a chair and crosses his legs. There is a visible weakening of exteroceptive sensation on the right side of the face. Frequent changes in the position of the head are also observed, resulting in a change in the relationship between the oral cavity and the throat, which negatively affects the swallowing process, and exposes the patient to aspiration of the chyme (which takes place many times). Bartosz's head is tilted forward, I also observed an unnatural curve of the neck, which makes it difficult to swallow properly. In addition, there are also major balance disturbances and difficulties in performing intentional movements associated with the occurrence of left-sided ataxia. In Bartosz's case, ataxia is of acquired nature, associated with focal lesions within the central nervous system (brain tumour). It manifests itself mainly in gait abnormalities (unsteady gait, on a wider basis) and is caused by damage to the main organ

²² He used a hearing aid in the past, but now he lost one of the elements (I recommended the patient a visit in the Audiological Outpatient Clinic for examination and selection of the appropriate hearing aid). The patient wears glasses.

of motor coordination – the cerebellum. Walking along the corridor, the Patient moves along its entire width, stumbles over his own legs. The muscle tension is too low, there is hypotension²³ (resulting from damage to the cerebellum, which is described in the earlier medical history).

Breathing and phonation

In the assessment of breathing and phonation, the respiratory tract was found to be improved, however, a single phase of the breathing was short and shallow. The patient's phonation time was very short – he was able to count up to 13 in one breath.

Assessment of the efficiency and structure of the articulation apparatus.

During the first therapeutic meeting, a qualitative examination was carried out to assess the mobility of the temporomandibular joints. Bartosz had problems with the coordination of the articulation apparatus, which resulted in the appearance of numerous articulation errors with the features of dysarthria^{24 25}. The chaos concerned especially the tongue and lips – the tongue was trembling, when it was extended and lifted it slightly deviated to the right. The force of pressing the tongue on the cheeks – weak. When making a circular movement of the tongue along the red lips – with the mouth wide open, incoherent movements of the tongue appear. The subject is able to smack – however, smacking was quiet and the lip tension was insufficient. During the tightening and stretching of the

²³ This disorder is atactic in nature and is associated with difficulties in maintaining balance.

²⁴ Dysarthria (Greek: dys- + artroun) is the inability to express oneself clearly caused by the bulbo-phonatory-articulation disorders syndrome. Damage to the centres and pathways innervating the speech organs, there are disturbances in the tension of the muscles participating in the angle of speech formation, which results in impaired coordination of the articulation apparatus.

²⁵ Tested using the dysarthria diagnosis sheet "Ocena Stanu Dyzartrii", ed. Izabela Gatkowska.

lips (alternately snout-smile), inaccuracy appeared, and when trying to put the upper lip on the lower one, and then the lower one on the upper one, the lack of precision of movements was visible. The patient is able to hold a spatula between the lips, but the resistance of the tongue (the tongue pushes the spatula out) causes problems. Moving the lower jaw from side to side is not entirely possible – the movement of the lower jaw is limited and lacks fluidity.

Continuous changes in Bartosz's posture, combined with quivering movements of the tongue, impaired coordination of the muscles of the tongue and cheeks, prevent the transport of the bite and result in difficulties in the initiation of the act of swallowing, leading to the regurgitation of the meal through the nose, coughing and choking. The lack of coordination of the articulation organs also caused the lack of clarity of speech, which in turn resulted in stress, which intensified articulation disorders.

Examination of swallowing

Despite many years of treatment, the patient's swallowing problems so far have not been diagnosed or considered in terms of physiotherapy. It was therefore necessary to perform an endoscopic examination of the upper digestive tract²⁶ to exclude reflux disease²⁷, hiatal hernia²⁸ or abnormalities in the anatomy of the digestive tract. An X-ray of the oesophagus and chest was also performed, which showed functional disorders in the swallowing process. The examinations ruled out reflux, the presence of a hernia and anatomy defects.

²⁶ This examination, also known as gastroscopy, consists in inserting a flexible apparatus into the throat and then into the oesophagus, stomach and duodenum, and possibly taking samples from the mucosa for histopathological examination.

²⁷ Reflux disease (*gastroesophageal reflux disease* - GERD) is a chronic disease of the upper digestive tract caused by the reflux of gastric contents into the oesophagus.

²⁸ This is an abnormal movement of part or all of the stomach into the chest – the top of the stomach is pushed into the chest through a thinner area in the diaphragm.

Examination of the oral cavity showed the pull of the uvula to the left, and a higher position of the left palatine arch. I also performed a qualitative assessment of the mobility of the temporomandibular joints – I assessed 3 movements: mandibular abduction, forward movement of the mandible and lateral movements of the mandible to the left and right. The examination also allowed me to assess the start of movement, its path, the emerging pain and resistance (at what point they occurred and what was their nature). Weak palatal and pharyngeal reflexes were also observed, resulting in difficulty swallowing. Due to the planned manual therapy, the tenderness of the soft tissues around the temporomandibular joints and the masseter muscle were also subjected to palpation.

The act of eating and swallowing meals by the Patient was also assessed. There was a visible weakness and increasing fatigue of the mandibular muscles during biting, which resulted in a reduction in the bite force, limited mobility of the mandible and a feeling of stiffness in the temporomandibular joints.

Bartosz complained about swallowing disorders (sometimes painful²⁹), regardless of the consistency of the meal. In addition, he also mentioned regurgitation of food, frequent heartburn, hiccups, distaste (bitterness) and bad breath. According to the Patient's account, he felt the fear of swallowing each bite of food. In order to avoid "backflow" (this was how the patient himself defined the phenomenon), he divided the bite into smaller parts and swallowed several times. In an interview, he admitted that eating meals takes him longer than other family members or friends, which results in impatience and irritation.

In the Dysphagia Severity Scale, Bartosz achieved level 4 (dysphagia, but it is possible to meet nutritional needs, although control and the use of supportive techniques are required). However, in the Dysphagia Rating Scale, the Patient's swallowing disorders vary between levels 4 and 5 (mild dysphagia requiring supervision,

²⁹ Pain when swallowing food is called *odynophagia* (gr. *Odyno* - pain; *phagein* - eat), it occurs together with dysphagia in patients after injuries and oesophagitis, and in the case of cancers of the mouth and throat.

swallowing restrictions apply to one/two consistencies).³⁰ The worst result was obtained by Bartosz in the MDADI questionnaire used in the study, and more precisely in the field of functional disorders: 10 points and emotional disorders: 30 points. The Patient obtained much more points in the group of questions concerning social functioning disorders – certainly the acceptance and support of the family (especially Bartosz's mother) and the understanding of the environment have a huge impact on this.

The neurologopedic examination, the patient's medical history and the symptoms described by him clearly indicated the presence of atactic (cerebellar)³¹. It is caused by damage/atrophy of the cerebellum (resulting from damage to the cerebellum, which is described in the earlier medical history), which results in damage to the cerebellar centre of speech coordination. Dysarthrititis is accompanied by moderate lower neurogenic (oesophageal) dysphagia³².

Selected therapeutic activities

Treatment of dysphagia depends on the place, cause of the disorder and its severity and can be divided into medical and therapeutic interventions.

Medical intervention (apart from pharmacology) of a compensatory nature, used in patients with severe forms of dysphagia, may include the insertion of a nasogastric tube – however, this does not improve the swallowing process.

³⁰ Scale and evaluation sheet are available at http://polykanie.reisspartners.pl/images/pdf/DysphagiaOutcomeSeverityScale_pol.jpg (13.03.2020).

³¹ It is caused by damage to the cerebellum (there is damage to the cerebellar center of speech coordination); related to asynergy, i.e. loss of the speech coordination centre [in:] Gatkowska I., *Diagnoza dyzartrii u dorosłych w neurologii klinicznej*, Cracow 2012, p. 46.

³² Neurogenic dysphagia is caused by neurological diseases, such as neuromuscular diseases, strokes, damage to the brainstem and cerebellum, and others. Neurogenic dysphagia is associated with damage to various levels of the nervous system: supranuclear, nuclei of motor nerves sensory nerves (involved in the swallowing process), peripheral nerves and others.

Therapeutic interventions include several areas of training. The first is to adopt and maintain a proper body posture during a meal, by which we mean a sitting position with an erect neck. The head should be in the axis of the body, not twisted or leaned back. The patient should see the meal he is consuming, as visual stimuli are a natural stimulator of the swallowing process. An important issue is also the eye contact between the patient and the feeding person (if the patient does not eat on their own) – this allows to adjust the size of the bite, the rate of feeding, give any instructions or provide help.

In addition, techniques that facilitate swallowing and eliminate the possibility of choking are also used. This increases the Patient's safety. In the case of coughing or choking after swallowing (i.e. weakened protection of the larynx or weakened movement of the tongue backwards), the so-called supraglottic swallowing is used. It consists in holding the breath while swallowing, and coughing up after swallowing. The diagram is as follows:

BREATHING IN → HOLDING BREATH → SWALLOWING →
BREATHING OUT WITH COUGHING UP → BREATHING IN

Another technique is the so-called Mendelson manoeuvre, consisting in deliberately prolonging the elevation of the back of the tongue and larynx during swallowing. As a result, the upper oesophageal sphincter widens, and the bolus swallowing force increases due to the strong retraction of the root of the tongue towards the back of the throat.

If the problem with swallowing requires swallowing of one bite of food several times, the work of the back wall of the throat and the root of the tongue should be strengthened.

According to the international division according to WHO from 2001, the following methods are used in the treatment of dysphagia: restitution, compensation and adaptative.

- Restitution therapy aims to restore the neuromuscular basis necessary for physiological swallowing, namely to improve

- impaired (e.g. muscular) functions and to train the elements necessary to learn compensatory swallowing techniques.
- Compensation therapy aims to achieve a swallowing reflex without risk of aspiration when physiological movements are limited or only partially preserved.

Treatment of swallowing disorders by means of compensation methods involves the use of various swallowing techniques and changes in body posture³³.

One of them may be a change in the mode of action during the swallowing process, e.g. turning the head.

- The aim of adaptive therapy is to increase the ability to swallow and to adjust the environment (food) to the patient's swallowing disorders. In any case, it is recommended to change the diet by initially reducing the amount of food consumed, and their consistency – they should be liquid, semi-liquid or crushed. Food portions should not be too large or too small (they do not put pressure on the tongue, palatal arches, and thus do not stimulate the swallowing reflex) – the optimal size is a bite with the volume of a large flat spoon. Place it in the centre of the tongue or on the healthy side (in case of unilateral paralysis). The taste and temperature of the meals are also very important.

Most people with dysphagia find it easier to swallow cold or very warm foods and fluids. The expressive taste and temperature are beneficial as they improve the sensation of the mouth and throat³⁴.

In the case of beverages, the Patient may use a straw or a sippy cup at the initial stage of treatment. In the next stages of treatment (if

³³ Olszewski J., Zielińska-Bliźniewska H., Pietkiewicz P., *Dysphagia as interdisciplinary diagnostic and therapeutic problem*, Łódź 2011, p. 45.

³⁴ Logemann J. A., *Management of dysphagia after stroke* [in:] *Recovery after Stroke*, Cambridge 2005, p. 195.

it is possible and the patient's condition improves), the consistency of the consumed food should be gradually increased and thickened, and drinking through a straw may be replaced by drinking from a cup with a rolled up edge.

The effects of therapy:

After 8 weeks of neurologopedic therapy, the follow-up examination showed the objective and subjective effects of the actions taken.

Bartosz indicated an improvement in the mobility of the temporomandibular joint, he also felt a reduction in the feeling of stiffness in the muscles, jaw and articulation organs, thanks to the correct body posture while eating.

In addition, the change in the Patient's quality of life also improved, which manifested itself in an improvement in the comfort of eating, moving and swallowing bites of food. It also influenced his family and social relations, more frequent relationships and initiating conversations. During the therapy, the density, structure and amount of food served to Bartosz were gradually increased. Initially, the patient consumed small amounts of semi-liquid dishes more often, and later crushed food. In the final phase of his stay, he ate a traditional lunch with other patients who had never been affected by swallowing disorders. Such socializing activities supported the patient not only in the treatment of dysphagia, but also influenced his psychosocial functioning. **This was confirmed by** the indicators of the quality of life in patients with dysphagia. According to the repeated MDADI questionnaire, Bartosz's score for functional disorders improved: from 10 to 30 points. The biggest improvement, however, was in the emotional area, which increased from 30 points to 80.

During the course of the therapy, his mental state improved, which was noticed by both himself and his family – he became cheerful, contented and very curious about the world. During therapy, he was attentive and concentrated. He willingly and actively participated in therapeutic classes – he asked a lot of questions, talked about his emotions and thoughts, systematically performed assigned tasks (he attached particular importance to written exercises). His moti-

vation and commitment increased significantly, also in the face of tasks undertaken in the family (joining the housework and the life of the community in which he functions on a daily basis). The stimulus for the patient was the noticeable first effects of his efforts and the improvement of the quality of life. In addition, the patient became more socially open – he made new relationships with others initiating conversations on his own.

In conclusion, the systematic rehabilitation of dysphagia is a very important process leading to the improvement of the Patient's quality of life and *the restoration of effective oral nutrition while maintaining or developing defensive reflexes*³⁵. *The prognosis (related to dysphagia MZ) depends on the underlying disease, appropriate treatment and prevention of acute respiratory complications*³⁶. Thanks to this, it is possible to plan the therapeutic activities as accurately and individually as possible, using various methods, adapted to the patient's abilities and limitations. Their aim is not only to treat dysphagia, but above all to improve the quality of life and increase the possibilities of psychosocial functioning.

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³⁵ Wiskirska-Woźnica B., Obrębowski A., Żebryk-Stopa A., *Rehabilitacja zaburzeń połykania*, [in:] *Wprowadzenie do neurologopedii*, Poznań 2012, p. 379.

³⁶ Chaudhury A., Mashimo H., *Zaburzenie motoryki jamy ustno-gardłowej oraz przełyku*, Boston 2015, p. 167.

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