14.2. *Summary*

Extending human life is a great medical success, but it is associated with an increased frequency of diseases that were previously rarely recognized. These include osteoarthritis of the hip. The most important symptom of the disease is pain in the groin radiating to the knee joint, limiting its mobility and reducing the patient's activity and quality of life. In the absence of improvement during the treatment with non-surgical methods, the „gold standard" is to replace the „worn" natural bio-placenta and replace it with an artificial hip joint.

Aim of the thesis – the aim of the study is to assess the early results of treatment after alloplasty of the hip performed due to advanced primary degenerative changes in the joint.

Work methodology – the observation period lasted 6 months. The aim of the thesis was based on the following data:

1. Sex and age of the respondents, the operated side, the profession performed before the implantation of the artificial hip joint.
2. The results of subjective measurement of the sensation of variable intensity of pain using the VAS scale (measurements were taken the day before the planned procedure, one day after the procedure, on the day of discharge from the hospital, two months later and six months after the alloplasty of hip joint).
3. The results of the modified Harris functional scale and the pain and function subscale (measurements were taken the day before the planned procedure, on the day of discharge from the hospital and two and six months after the alloplasty of hip joint).
4. The extent of hip flexion and abduction [°] (measurements were taken the day before the planned procedure, after two months and in the sixth month after the alloplasty of hip joint).
5. Differences in the length of the lower limbs [cm] (measurements were taken the day before the surgery and six months after the alloplasty of hip joint).
6. What orthopedic aids did patients use while walking (the test was performed the day before the planned surgery, on the day of discharge from the hospital, two and six months after the alloplasty of hip joint).

To evaluate the quantitative characteristics, the following parameters were calculated: arithmetic mean, median, minimum and maximum, standard deviation. Not all analyzed variables were normally distributed, therefore non-parametric tests were used to analyse the significance of differences between the obtained results. Comparisons of the arithmetic means were made using the test t-Student at the significance level of $p = 0.05$.

Research material – the aim of the thesis was based on the research material of Ward of Traumatology and Orthopaedics of the Medical Care Centre [COM] in Jarosław. The study group consisted of 50 women and 40 men randomly selected and qualified for unilateral replacement of the degenerated 92 hip joint, in the place of which a cementless ABG II

artificial hip joint was implanted. The mean age of women was 69.2 (SD ± 7.5), and of men 69.4 (SD ± 6.7). There was no statistically significant difference between the arithmetic mean age of the group of women and men. In the group of women and men, artificial hip joints were more often implanted on the right side (in 56% of operated patients). The largest professional group were labourers (31 patients) and farmers (31 patients).

Research results

The highest values of the subjective sensation of hip pain according to the VAS scale in the group of women and men were found one day after the alloplasty of hip joint ($\overline{X}$ = 8.9–9.3), slightly lower one day before the planned procedure ($\overline{X}$ = 7.7–8.1). After the procedure, the assessment of the level of noticeable pain at individual stages of the research showed a clear decreasing tendency. Six months after prosthetic arthroplasty, the mean values of the male and female groups were within 0.8–1.0 units (range from 0–3). There was a statistically significant difference (t = 3.17–25.51) between the compared arithmetic mean values of the subjective pain sensation in the group of women and men: the day before the procedure, on the day of discharge from the hospital, the day of discharge from the hospital – 2 months after the procedure, 2 months after the procedure – 6 months after the procedure. The comparison of the arithmetic means of subjective pain sensation in the group of women and men in the same periods, both before and after the alloplasty, shows that there was no statistically significant difference between them (t = 0.1–1.6). There was no significant correlation between pain sensation and gender and age of the patients.

After the performed alloplasty, as the tests were carried out, there was a tendency to increase the number of points (indirectly improve the patient's condition) in each subsequent examination. In the 6th month after the alloplasty, the values of the Harris index and the pain subscale were on the borderline between moderate and good results. There was a statistically significant difference (t = 2.27–18.28) between the compared arithmetic mean values of the Harris rate in the group of women and men the day before the procedure – on the day of discharge from the hospital, the day of discharge from the hospital – 2 months after the procedure, 2 months after the procedure – 6 months after the procedure. The comparison of the arithmetic mean values of the Harris rate using the test t-Student of the group of women and men on the day before the procedure showed a borderline difference, on the day of discharge from the hospital, the means did not differ from each other. Significant differences between the arithmetic means were found 2 and 6 months after the procedure (t = 2.67–3.53). The least favorable numerical values of the function subscale were found on the day of patients' discharge from hospital, higher one day before the planned procedure (between the arithmetic means in the studied periods, there was a statistically significant difference between the mean 93 values of the function subscale (t = 3.9–6.2). Two months after the undergoing alloplasty, the mean numerical values of the function subscale were almost 3 points higher compared to the values from the period before the planned alloplasty. Six months after the

procedure, the mean numerical values of the function subscale were averagely 3 units lower than the highest values in healthy subjects. There was a statistically significant difference (t = 3.9–20.8) between the values of the arithmetic means of the subscale of functions of a group of women and men; the day before the procedure – the day of discharge from the hospital, the day of discharge from the hospital – 2 months after the procedure, 2 months after the procedure – 6 months after the procedure. One did not state statistically significant difference between the compared arithmetic mean values of the subscale of functions of the group of women and men on the day of hospital discharge and 6 months after implantation of the artificial hip joint (t = 0.75–1.9). A statistically significant difference was found when comparing the arithmetic mean values of the group of women and men the day before the planned procedure and two months after the procedure (t = 2.93–6.6). One did not state statistically significant difference between the compared arithmetic mean values of the subscale of functions of the group of women and men on the day of hospital discharge and 6 months after implantation of the artificial hip joint (table 23) (t = 0.75–1.9). A statistically significant difference occurred when comparing the arithmetic mean values of the group of women and men the day before the planned procedure and 2 months after the implantation of the joint (t = 2.93–6.6).

The mean values of flexion in the hip joint one day before the planned arthroplasty in the group of men and women were the lowest and identical ($\overline{X}$ = 34°; SD = 5.6–6.2). Two months after the procedure, the mean values of joint flexion in both studied groups increased averagely by 6° ($\overline{X}$ = 39°, spread 30–50°). After 6 months, the mean extent of hip flexion in both groups was 49° (spread 40–60°). The mean increase in hip flexion in the group of women and men 6 months after hip alloplasty was the same and increased averagely by 15° compared to the examination performed the day before the procedure. In the histogram, the trend lines of the flexion increase of the studied groups of men and women are identical (overlapping) and are of an increasing nature. One states a statistically significant difference (t = 4.27–7.16) from the comparison of the arithmetic mean values of flexion in the group of men and women: the day before the procedure – on the day of discharge from the hospital, the day of discharge from the hospital – 2 months after the procedure, 2 months after the procedure – 6 months after the procedure. There was no statistically significant difference between the mean values of the hip flexion angle in the group of women and men in the same time periods before and after the alloplasty of the hip joint (t = 0.0–0.19). In the group of women and men, a slight increase in the hip flexion angle was found with increasing age. Occurring differences are slight.

One day before the planned implantation of the artificial hip joint, the mean values of the hip abduction in the group of women and men were comparable and equaled 13°. Two months after the procedure, the mean size of the abduction in the group of patients increased to 18°, in the group of men to 16°, in the sixth month, after the alloplasty, it was on average 21° in the group of women, and 19° in the group of men. In the group of women and men there was a statistically significant difference between the arithmetic

mean values of the abduction one day before the planned procedure and the mean value of the abduction 2 months after the procedure and 2 months and 6 months after the procedure (t = 2.12–2.43). The comparison of the mean values of abduction in the hip joint of the group of women and men in the same periods before and after the alloplasty showed that there was no statistically significant difference between them (t = 0.62–1.76). In the group of women and men, there was a slight increase in the hip flexion angle, which decreased with increasing age of the patients. The increase in the abduction value in the hip joint was slightly greater in the younger people, and smaller in the elderly. The differences are insignificant and the shown trends are poorly marked. In 51% of the analyzed patients, hip abduction did not change. The improvement in abduction mobility was found in 44 patients.

The day before the planned procedure, all patients used orthopedic equipment while walking. Slightly more than half of them (53% of respondents) used two elbow sticks. 24 men and 16 women walked with the help of one elbow cane, two patients walked with the help of a walking frame. On the day of the patients' discharge, 48 women and all men used two elbow canes while walking. Two patients were moving with the help of a walking frame.

Two months after the procedure, all patients used two elbow walking sticks while walking. Six months after the surgery, 64 patients were walking without walking sticks (37 women and 27 men). 11 women and the same number of men used one elbow cane. Two women and two men assisted each other while walking with two elbow sticks.

One day before implantation of the artificial hip joint, shortening of the right lower limb was found in 33 patients and 21 men. The size of the shortening ranged from 1–3 cm ($\overline{X}$ = 2.1–2.3; SD = 0.8–0.7). One did not state statistically significant difference between the arithmetic means of the group of women and men before the planned procedure (t = 1.26). Six months after the arthroplasty, the number of patients with limb shortening dramatically decreased (from 55 to 8 patients). The mean shortening of the lower limb also decreased ($\overline{X}$ group of women from 2.1 to 1.0 cm; $\overline{X}$ group of men from 2.3 to 1.2 cm). In all patients, the shortening of the operated limb was reduced by 1–3 cm.