RESULTS AND OBSERVATIONS

**Table 1: Age of the patients (n=50)**

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| **Age (in years) of the patients** | **Number of patients** | **Percentage** |
| **≤30** | 20 | 40.0 |
| **31-40** | 19 | 38.0 |
| **>40** | 11 | 22.0 |
| **Mean±SD** | 34.28±16.64 |  |
| **Range (min, max)** | 1, 72 |  |

Table 1 presents the age distribution of 50 patients included in the study. The majority of patients are younger, with 40% (20 patients) aged 30 years or younger, and 38% (19 patients) between 31 and 40 years old. A smaller proportion, 22% (11 patients), are older than 40 years. The mean age of the patients is 34.28 years, with a standard deviation of 16.64 years, indicating significant age variability within the sample. The age range spans from 1 to 72 years, highlighting the inclusion of both younger and older patients.

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| **Figure 1: Bar diagram shows age distribution of the study patients** |

**Table 2: Marital status of the patients (n=50)**

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| **Marital status of the patients** | **Number of patients** | **Percentage** |
| **Married** | 29 | 58.0 |
| **Unmarried** | 21 | 42.0 |

Table 2 presents the marital status of the 50 patients in the study. Of the total sample, 58% (29 patients) are married, while 42% (21 patients) are unmarried. This indicates that a majority of the patients are married, though a notable proportion remains unmarried.

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| **Figure 2: Pie chart shows marital status of the study patients** |

**Table 3: Distribution of the study patients by clinical presentation (n=50)**

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| **Clinical presentation of the patients** | **Number of patients** | **Percentage** |
| **Pain** | 18 | 36.0 |
| **Swelling** | 50 | 100.0 |
| **Fever** | 4 | 8.0 |

***\*Note- Multiple responses were observed***

Table 3 outlines the clinical presentations observed in the 50 patients included in the study. Swelling was the most common symptom, reported by all 50 patients (100%). Pain was experienced by 18 patients (36%), and fever was noted in 4 patients (8%).

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| **Figure 3: Bar diagram shows clinical presentation of the study patients** |

**Table 4: Distribution of the study patients by physical examination (n=50)**

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| **Physical examination of the patients** | **Number of patients** | **Percentage** |
| **Pulse** |  |  |
| Normal | 36 | 72.0 |
| Raised | 14 | 28.0 |
| **Temperature** |  |  |
| Normal | 50 | 100.0 |
| Raised | 0 | 0.0 |
| **Tenderness** |  |  |
| Yes | 24 | 48.0 |
| No | 26 | 52.0 |

Table 4 presents the findings from the physical examination of the 50 patients in the study. Regarding pulse, 72% of patients (36 individuals) had a normal pulse, while 28% (14 patients) had a raised pulse. All patients (100%) had a normal temperature, with no patients exhibiting a raised temperature. As for tenderness, 48% (24 patients) showed tenderness during the examination, while 52% (26 patients) did not.

**Table 5: Distribution of the study patients by gray scale of the lesion (n=50)**

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| **Gray scale of the lesion** | **Number of patients** | **Percentage** |
| **Site of the lesion** |  |  |
| Testicular | 50 | 100.0 |
| Extra-testicular | 0 | 0.0 |
| **Type of the lesion** |  |  |
| Focal | 33 | 66.0 |
| Diffuse | 17 | 34.0 |
| **Echogenicity of the lesion** |  |  |
| Normal echotexture | 0 | 0.0 |
| Homogeneously hypoechoic | 8 | 16.0 |
| Mixed echogenic heterogenous | 42 | 84.0 |
| Hyperechoic | 0 | 0.0 |
| **Margin of lesion** |  |  |
| Well defined | 9 | 18.0 |
| Poorly defined | 41 | 82.0 |

Table 5 describes the distribution of the 50 patients based on the gray scale characteristics of their lesions as observed on imaging. All patients (100%) had testicular lesions, with no cases of extra-testicular lesions. Regarding the type of lesion, 66% (33 patients) had focal lesions, while 34% (17 patients) had diffuse lesions. In terms of echogenicity, 84% (42 patients) exhibited mixed echogenic heterogeneous lesions, 16% (8 patients) had homogeneously hypoechoic lesions, and none showed normal echotexture or hyperechoic lesions. As for the margin of the lesions, 82% (41 patients) had poorly defined margins, while only 18% (9 patients) had well-defined margins.

**Table 6: Distribution of the study patients by CDUS finding of testicular lesion (n=50)**

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| **CDUS finding of testicular lesion** | **Number of patients** | **Percentage** |
| **Grades of vascularity** |  |  |
| Grade 0 | 5 | 10.0 |
| Grade 1 | 39 | 78.0 |
| Grade 2 | 8 | 12.0 |
| Grade 3 | 6 | 0.0 |
| **Pattern of vascularity** |  |  |
| Regular (branching linear) | 1 | 2.0 |
| Non-branching linear | 16 | 32.0 |
| Scattered / random | 33 | 66.0 |
| **PSV (Peak systolic velocity)** |  |  |
| Normal | 10 | 20.0 |
| Increased | 32 | 64.0 |
| Decreased | 8 | 16.0 |
| **EDV (End diastolic velocity)** |  |  |
| Normal | 10 | 32.0 |
| Increased | 30 | 4.0 |
| Decreased | 10 | 64.0 |
| **RI (Resistivity Index)** |  |  |
| Normal | 16 | 32.0 |
| Increased | 2 | 4.0 |
| Decreased | 32 | 64.0 |

Table 6 presents the findings from Color Doppler Ultrasound (CDUS) assessment of the testicular lesions in the 50 study patients. Regarding vascularity, 78% (39 patients) had Grade 1 vascularity, 12% (8 patients) had Grade 2, and 10% (5 patients) had Grade 0, while no patients had Grade 3 vascularity. For the pattern of vascularity, the majority of patients (66%, 33 patients) exhibited a scattered/random pattern, followed by 32% (16 patients) with a non-branching linear pattern, and only 2% (1 patient) with a regular (branching linear) pattern. In terms of peak systolic velocity (PSV), 64% (32 patients) had increased PSV, 20% (10 patients) had normal PSV, and 16% (8 patients) had decreased PSV. For end diastolic velocity (EDV), 64% (32 patients) showed decreased EDV, 32% (16 patients) had normal EDV, and 4% (2 patients) had increased EDV. Finally, for the resistivity index (RI), 64% (32 patients) had a decreased RI, 32% (16 patients) had a normal RI, and 4% (2 patients) had an increased RI.

**Table 7: Distribution of the study patients by Color Doppler Ultrasound (CDUS) diagnosis (n=50)**

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| **Color Doppler Ultrasound diagnosis** | **Number of patients** | **Percentage** |
| **Benign** | 2 | 4.0 |
| **Malignant** | 48 | 96.0 |

Table 7 presents the Color Doppler Ultrasound (CDUS) diagnosis of testicular lesions in the 50 study patients. The majority of patients, 96% (48 patients), were diagnosed with malignant lesions, while only 4% (2 patients) were diagnosed with benign lesions.

**Table 8: Distribution of the study patients by Histopathological diagnosis (n=50)**

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| **Histopathological diagnosis** | **Number of patients** | **Percentage** |
| **Benign** | 13 | 26.0 |
| **Malignant** | 37 | 74.0 |

Table 8 presents the histopathological diagnosis of the 50 study patients. The majority of patients, 74% (37 patients), were diagnosed with malignant lesions, while 26% (13 patients) had benign lesions.

**Table 9: Distribution of the study patients with parotid tumor according to Color Doppler USG (n=50)**

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|  | **Histopathological diagnosis** | | **P-value** |
|  | **Benign**  **n (%)** | **Malignant**  **n (%)** |
| **Age (in years)** |  |  |  |
| ≤30 | 7 (53.8) | 13 (35.1) | 0.290 |
| 31-40 | 5 (38.5) | 14 (37.8) |  |
| >40 | 1 (7.7) | 10 (27.0) |  |
| **Marital status of the patients** |  |  |  |
| Married | 7 (53.8) | 22 (59.5) | 0.754 |
| Unmarried | 6 (46.2) | 15 (40.5) |  |
| **clinical presentation of the patients\*** |  |  |  |
| Pain | 11 (84.6) | 7 (18.9) | <0.001 |
| Swelling | 13 (100.0) | 37 (100.0) | - |
| Fever | 4 (30.8) | 0 (0.0) | 0.003 |
| **Physical examination of the patients** |  |  |  |
| **Pulse** |  |  |  |
| Normal | 5 (38.5) | 31 (83.8) | 0.004 |
| Raised | 8 (61.5) | 6 (16.2) |  |
| **Temperature** |  |  |  |
| Normal | 13 (100.0) | 37 (100.0) | - |
| Raised | - | - |  |
| **Tenderness** |  |  |  |
| Yes | 10 (76.9) | 14 (37.8) | 0.024 |
| No | 3 (23.1) | 23 (62.2) |  |
| Gray scale of the lesion |  |  |  |
| **Site of the lesion** |  |  |  |
| Testicular | 13 (100.0) | 37 (100.0) | - |
| Extra-testicular | - | - |  |
| **Type of the lesion** |  |  |  |
| Focal | 11 (84.6) | 22 (59.5) | 0.173 |
| Diffuse | 2 (15.4) | 15 (40.5) |  |
| **Echogenicity of the lesion** |  |  |  |
| Homogeneously hypoechoic | 1 (7.7) | 7 (18.9) | 0.662 |
| Mixed echogenic heterogenous | 12 (92.3) | 30 (81.1) |  |
| **Margin of lesion** |  |  |  |
| Well defined | 6 (46.2) | 3 (8.1) | 0.006 |
| Poorly defined | 7 (53.8) | 34 (91.9) |  |
| **CDUS finding of testicular lesion** |  |  |  |
| **Grades of vascularity** |  |  |  |
| Grade 0 | 5 (38.5) | 0 (0.0) | <0.001 |
| Grade 1 | 7 (53.8) | 32 (86.5) |  |
| Grade 2 | 1 (7.7) | 5 (13.5) |  |
| **Pattern of vascularity** |  |  |  |
| Regular (branching linear) | 1 (7.7) | 0 (0.0) | 0.234 |
| Non-branching linear | 4 (30.8) | 12 (32.4) |  |
| Scattered / random | 8 (61.5) | 25 (67.6) |  |
| **PSV (Peak systolic velocity)** |  |  |  |
| Normal | 3 (23.1) | 7 (18.9) | 0.187 |
| Increased | 6 (46.2) | 26 (70.3) |  |
| Decreased | 4 (30.8) | 4 (10.8) |  |
| **EDV (End diastolic velocity)** |  |  |  |
| Normal | 2 (15.4) | 8 (21.6) | 0.518 |
| Increased | 7 (53.8) | 23 (62.2) |  |
| Decreased | 4 (30.8) | 6 (16.2) |  |
| **RI (Resistivity Index)** |  |  |  |
| Normal | 4 (30.8) | 12 (32.4) | 0.675 |
| Increased | 0 (0.0) | 2 (5.4) |  |
| Decreased | 9 (69.2) | 23 (62.2) |  |

Table 9 presents the distribution of study patients with parotid tumors according to their Color Doppler Ultrasound (CDUS) findings, broken down by histopathological diagnosis (benign vs. malignant) and various clinical, physical examination, and imaging parameters. The table includes P-values to assess the statistical significance of differences between the two groups.

In terms of **age**, there is no significant difference between benign and malignant cases (P = 0.290), with patients aged ≤30 years having a higher proportion of benign tumors. Regarding **marital status**, the distribution between married and unmarried patients is similar for both benign and malignant groups (P = 0.754), indicating no association with tumor type. However, for **clinical presentations**, there are significant differences: **pain** was more common in benign cases (84.6%) compared to malignant cases (18.9%) with a P-value of <0.001, and **fever** was more frequently observed in benign cases (30.8%) compared to malignant cases (0%) with a P-value of 0.003.

In the **physical examination** findings, a significant difference in **pulse** was noted (P = 0.004), with a higher proportion of normal pulses in malignant cases (83.8%) and raised pulses in benign cases (61.5%). For **tenderness**, more benign patients (76.9%) exhibited tenderness compared to malignant patients (37.8%) with a P-value of 0.024. Both groups had **normal temperatures** (100%).

The **gray scale of the lesion** showed that both benign and malignant tumors were **testicular**, with no extra-testicular lesions in either group. For the **type of lesion**, a higher proportion of focal lesions were observed in benign cases (84.6%), while diffuse lesions were more common in malignant cases (40.5%), though this difference was not statistically significant (P = 0.173). Regarding **echogenicity**, both groups predominantly had mixed echogenic heterogeneous lesions (92.3% in benign vs. 81.1% in malignant), with no significant difference (P = 0.662).

The **CDUS findings** revealed significant differences in **vascularity grades**: Grade 0 vascularity was more common in benign cases (38.5%) compared to malignant ones (0%), with a P-value of <0.001. Most malignant lesions had Grade 1 vascularity (86.5%). The **pattern of vascularity** was not significantly different between the two groups (P = 0.234), with the majority of lesions having a scattered/random vascular pattern. For **peak systolic velocity (PSV)**, malignant lesions were more likely to have increased PSV (70.3%) compared to benign lesions (46.2%) with a P-value of 0.187. **End diastolic velocity (EDV)** did not show significant differences (P = 0.518), though increased EDV was more common in both groups. Lastly, the **resistivity index (RI)** was significantly lower in benign cases (69.2% with decreased RI) compared to malignant cases (62.2% with decreased RI), though the difference was not highly significant (P = 0.675).

**Table 10: Comparison of Color Doppler ultrasonogram diagnosis with histopathological diagnosis (n=50)**

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| **Diagnosis by Color Doppler ultrasonogram** | **Histopathological diagnosis** | | **P-value** |
| **Malignant**  **n (%)** | **Benign**  **n (%)** |
| **Malignant, n (%)** | 37 (100.0) | 2 (15.4) | 0.064 |
| **Benign, n (%)** | 0 (0.0) | 11 (84.6) |  |

Table 10 compares the diagnosis made by Color Doppler ultrasonography (CDUS) with the histopathological diagnosis of the 50 study patients. The table shows that of the 37 patients diagnosed as malignant by CDUS, all were confirmed as malignant on histopathology (100%), while 2 (15.4%) were diagnosed as benign by histopathology. Conversely, CDUS identified no patients as benign, while 11 patients (84.6%) were diagnosed as benign histopathologically. The P-value of 0.064 suggests that there is no statistically significant difference between the CDUS and histopathological diagnoses, indicating that CDUS may be a useful diagnostic tool, although there is still some discrepancy in identifying benign cases.

**Table 11: Sensitivity, specificity, accuracy, positive and negative predictive values of the Color Doppler ultrasonogram in evaluation of benign and malignant parotid tumors (n=50).**

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| **Validity test** | **Benign** | **Malignant** |
| Sensitivity | 100.0 | 84.6 |
| Specificity | 84.6 | 100.0 |
| Accuracy | 92.3 | 92.3 |
| Positive predictive value | 100.0 | 84.6 |
| Negative predictive value | 84.6 | 100.0 |
| Positive likelihood ratio | 6.49 | - |
| Negative likelihood ratio | - | 0.15 |

Table 10 compares the diagnosis made by Color Doppler ultrasonography (CDUS) with the histopathological diagnosis of the 50 study patients. The table shows that of the 37 patients diagnosed as malignant by CDUS, all were confirmed as malignant on histopathology (100%), while 2 (15.4%) were diagnosed as benign by histopathology. Conversely, CDUS identified no patients as benign, while 11 patients (84.6%) were diagnosed as benign histopathologically. The P-value of 0.064 suggests that there is no statistically significant difference between the CDUS and histopathological diagnoses, indicating that CDUS may be a useful diagnostic tool, although there is still some discrepancy in identifying benign cases.