

# The Importance of Panitumumab in Radiotherapy Involving Head and Neck Region

Yasemin Benderli Cihan<sup>1</sup>

Received: 5 February 2018 / Accepted: 20 July 2018 / Published online: 27 July 2018  
© The Association of Oral and Maxillofacial Surgeons of India 2018

Novel therapeutic targets have been discovered in parallel to rapid advancement in tumor biology and oncogenesis. Current research efforts in cancer therapy have focused on many novel agents with less adverse effects which direct biological pathways. Panitumumab (Vecibix) is one of these novel agents. It is a novel agent in cancer therapy.

Panitumumab is a humanized, monoclonal IgG2 antibody. It inhibits proliferation of tumor cell by preventing autocrine EGFR stimulation of tumor cells via binding EGFR [1, 2]. In many series, it has been shown that, despite adverse effects, the panitumumab plus cytotoxic chemotherapy was associated to significant improvement in objective rate, median progression-free survival and overall survival when compared to cytotoxic chemotherapy alone in colon cancer. Besides adverse effects seen in classical chemotherapy, skin reactions (acne, dermatitis, erythema, flushing, sloughing and photosensitivity) are most important adverse effects seen in patients receiving panitumumab. Skin reactions generally affect 90% of patients [2, 3].

There are ongoing phase I and II studies on combined use of panitumumab with chemoradiotherapy in head and neck tumors; however, number of studies is limited in the literature. Preclinical data suggested that radiotherapy and agents directing EGFR showed synergistic effect. In a phase II study, Ferris et al. evaluated 46 patients with human papilloma virus (HPV)-negative head–neck cancer (stage 3 or 4a squamous cell cancer) who were at high-risk group (tumor margin < 1 mm, extra-capsular invasion,

perineural and angiolymphatic invasion and two positive lymph nodes). The patients received postoperative radiotherapy (60–66 Gy, over 6–7 weeks) concurrent with weekly cisplatin (30 mg/m<sup>2</sup>) plus panitumumab (2.5 mg/kg). Two-year progression-free and overall survival rates were found to be 70 and 72%, respectively. Authors suggested the addition of panitumumab to cisplatin plus radiotherapy regimen improved effectiveness in high-risk, resected head and neck tumors [2]. On the other hand, in another phase II study (CONCERT-1), it was reported that the addition of panitumumab to standard fractionated radiotherapy plus cisplatin regimen had no benefit in unresectable, locally advanced, squamous cell head and neck tumors [4]. In CONCERT-2, the patients with unresectable, stage 3-to-4b squamous cell cancer were randomized into two arms. The patients receiving radiotherapy plus cisplatin were compared to those radiotherapy plus panitumumab. No superiority was shown for panitumumab [5]. Another study compared patients receiving panitumumab plus fractionation radiotherapy with those receiving cisplatin plus standard fractionation radiotherapy, indicating no significant differences in progression-free survival between groups [6]. In HPV-positive patients, radiotherapy was used in combination with EGFR inhibitors. The disease-free and overall survivals were found to be significantly better when compared to traditional cisplatin plus radiotherapy regimen [7]. To the best of our knowledge, there is no clinical trial investigating panitumumab use in combination with stereotactic radiosurgery in patients with head and neck cancer.

In conclusion, as in cetuximab (an EGFR inhibitor) the effectiveness of panitumumab is of importance, even it is observed in a certain patient group. Authors think that HPV can be determinant in the course of disease. Further studies

✉ Yasemin Benderli Cihan  
cihany@erciyes.edu.tr

<sup>1</sup> Department of Radiation Oncology, Kayseri Education and Research Hospital, 38010 Kayseri, Turkey

are needed in the light of available clinical and biological data which are now insufficient but promising.

## References

1. Françaço A, Simioni PU (2017) Immunotherapy for the treatment of colorectal tumors: focus on approved and in-clinical-trial monoclonal antibodies. *Drug Des Devel Ther* 11:177–184. <https://doi.org/10.2147/dddt.s119036> (**eCollection 2017**)
2. Ferris RL, Geiger JL, Trivedi S, Schmitt NC, Heron DE, Johnson JT, Kim S, Duvvuri U, Clump DA, Bauman JE, Ohr JP, Gooding WE, Argiris A (2016) Phase II trial of post-operative radiotherapy with concurrent cisplatin plus panitumumab in patients with high-risk, resected head and neck cancer. *Ann Oncol* 27(12):2257–2262. <https://doi.org/10.1093/annonc/mdw428> (**Epub 2016 Oct 11**)
3. Patel SB, Gill D, Garrido-Laguna I (2016) Profile of panitumumab as first-line treatment in patients with wild-type KRAS metastatic colorectal cancer. *OncoTargets Ther* 9:75–86
4. Mesia R, Henke M, Fortin A et al (2015) Chemoradiotherapy with or without panitumumab in patients with unresected, locally advanced squamous-cell carcinoma of the head and neck (CONCERT-1): a randomised, controlled, open-label phase 2 trial. *Lancet Oncol* 16(2):208–220
5. Giralt J, Trigo J, Nuyts S, Ozsahin M, Skladowski K, Hatoum G et al (2015) Panitumumab plus radiotherapy versus chemoradiotherapy in patients with unresected, locally advanced squamous-cell carcinoma of the head and neck (CONCERT-2): a randomised, controlled, open-label phase 2 trial. *Lancet Oncol* 16(2):221–232. [https://doi.org/10.1016/S1470-2045\(14\)71200-8](https://doi.org/10.1016/S1470-2045(14)71200-8) (**Epub 2015 Jan 15**)
6. Siu LL, Waldron JN, Chen BE, Winkquist E, Wright JR, Nabid A, Hay JH, Ringash J, Liu G, Johnson A, Shenouda G, Chasen M, Pearce A, Butler JB, Breen S, Chen EX, FitzGerald TJ, Childs TJ, Montenegro A, O'Sullivan B, Parulekar WR (2016) Effect of standard radiotherapy with cisplatin vs accelerated radiotherapy with panitumumab in locoregionally advanced squamous cell head and neck carcinoma: a randomized clinical trial. *JAMA Oncol*. <https://doi.org/10.1001/jamaoncol.2016.4510> (**Epubahead of print**)
7. Pajares B, Trigo JM, Toledo MD, Álvarez M, González-Hermoso C, Rueda A, Medina JA, de Luque V, Jerez JM, Alba E (2013) Differential outcome of concurrent radiotherapy plus epidermal growth factor receptor inhibitors versus radiotherapy plus cisplatin in patients with human papillomavirus-related head and neck cancer. *BMC Cancer* 18(13):26. <https://doi.org/10.1186/1471-2407-13-26>